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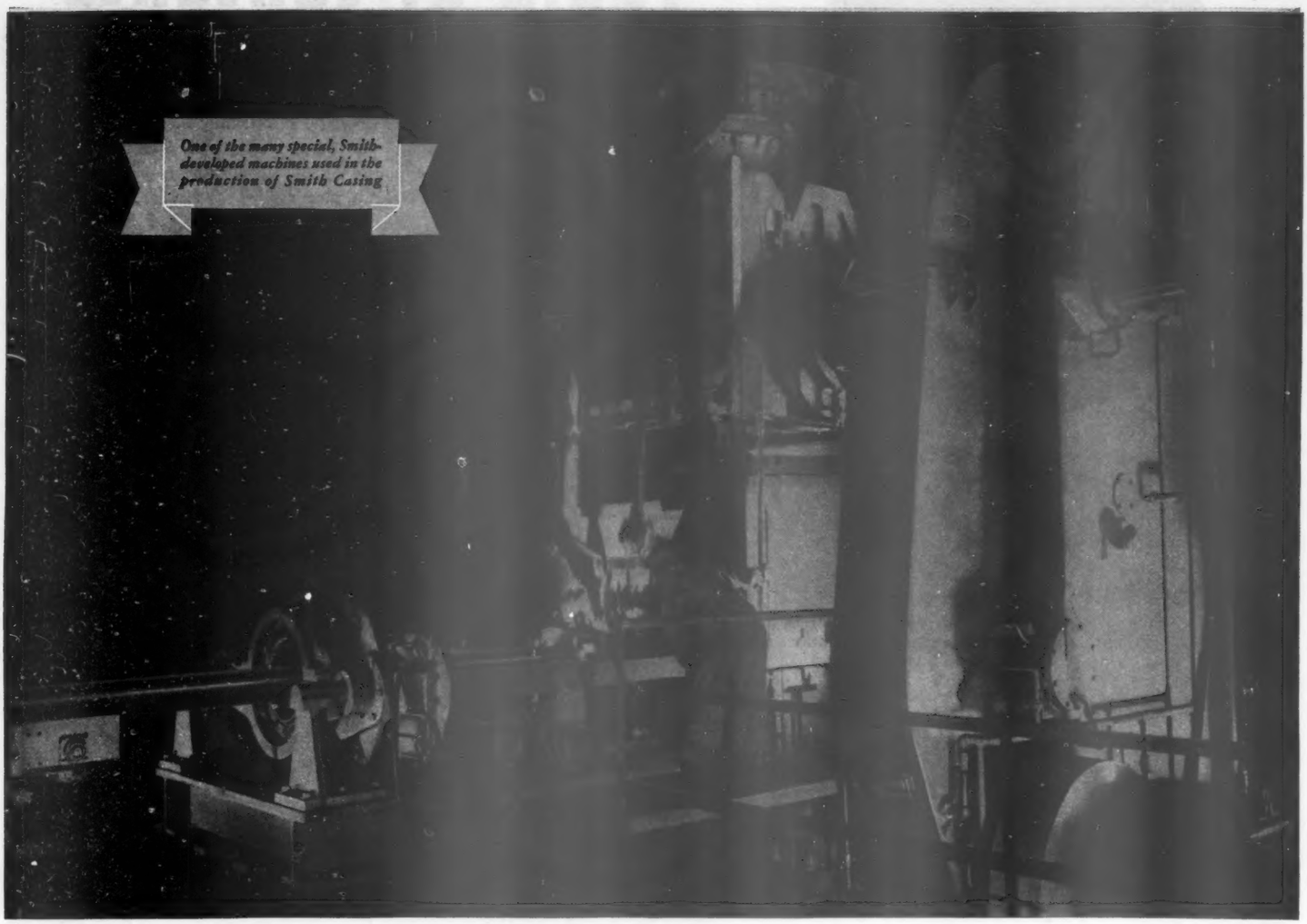

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Trends

Resumption of Coast Movement Only Quick Solution to Rationing

THE war will be brought home to tens of thousands of motorists in 17 eastern states and the District of Columbia (District 1) starting Friday when gasoline consumption by the least essential users will be reduced approximately 75 per cent below normal. The severe rationing is being accompanied by equally drastic orders affecting refinery and transportation operations in the adjoining areas in order to make additional petroleum available immediately to District 1. The program involves increased tank-car shipments from Districts 2 and 3 with emphasis placed on the heavy oils, to secure which will mean major adjustments in yields at most refineries located in the Middle West and Southwest. Inland waterway and truck transportation is to be expanded under the plan in which all facilities will be pooled to secure the maximum movement to the East.

CRUDE PRODUCTION *3,565,495 bbl. daily average — up 219,660 bbl. One year ago 3,748,735 bbl.*

CRUDE STOCKS *259,145,000 bbl. as of May 2 — up 2,072,000 bbl. One year ago 265,720,000 bbl.*

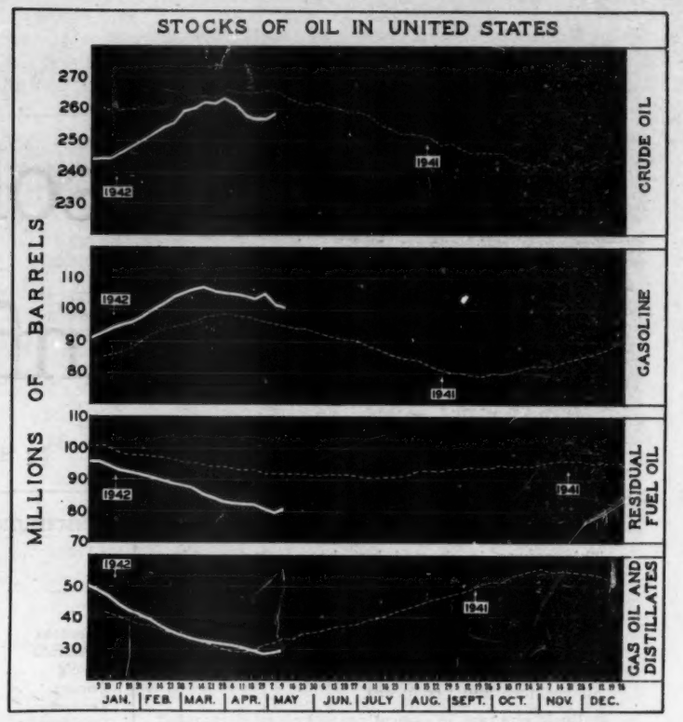
GASOLINE STOCKS *100,650,000 bbl. as of May 9—down 726,000 bbl. One year ago 95,150,000 bbl.*

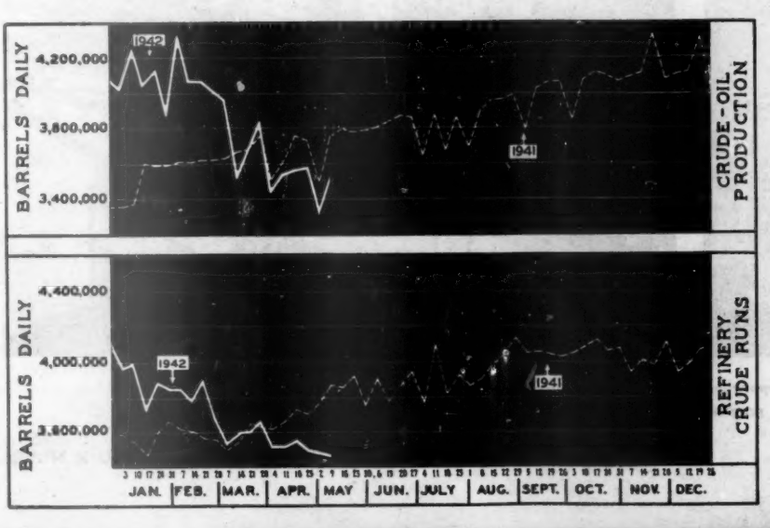
RESIDUAL FUEL-OIL STOCKS *80,155,000 bbl. as of May 9—up 216,000 bbl. One year ago 92,156,000 bbl.*

GAS OIL AND DISTILLATES *29,947,000 bbl. as of May 9—up 309,000 bbl. One year ago 33,284,000 bbl.*

REFINERY RUNS *3,406,000 bbl. daily week ended May 9 — down 35,000 bbl. One year ago 3,876,000 bbl.*

Statisticians of the industry who are analyzing the data covering the petroleum needs and supplies of Atlantic seaboard states are in agreement that the two will not be balanced after all inland transportation facilities are placed in operation. A several-point pipe-line program to the East will shortly be under way but no important part of this plan will be completed under 3 months and it will be late fall or early winter before the main features can be in operation. These supplementary pipe lines will not close the gap between eastern supplies and demands as projected for the latter part of this year. Construction of one or more new pipe-line systems connecting the southwestern fields with eastern refinery centers could not be completed before early 1943, should these pending projects be approved in the near future.





DAILY AVERAGE PRODUCTION FOR WEEK

	May 9, 1942	May OPC recommended production	May 2, 1942
Arkansas	71,100	74,000	73,620
California	659,750	673,800	621,750
Colorado	7,560	7,900	8,150
Eastern fields	124,050	123,300	117,300
Illinois	315,470	329,200	294,985
Kansas	242,950	259,300	255,300
Louisiana	311,065	298,600	314,340
North Louisiana	*81,765*	.....	*81,840*
Louisiana Gulf Coast	*229,300*	.....	*232,500*
Michigan	64,100	60,500	63,200
Mississippi	89,910	48,100	91,240
Montana	21,690	25,200	21,590
Nebraska	3,750	4,500	3,900
New Mexico	86,470	73,300	86,510
Oklahoma	398,950	438,500	404,650
Texas	1,075,850	960,000	896,500
East Texas	*225,900*	.....	*146,400*
West Texas	*186,200*	.....	*140,150*
North Central Texas	*144,900*	.....	*161,800*
East Central Texas	*79,250*	.....	*73,900*
Texas Panhandle	*82,200*	.....	*78,500*
Texas Gulf Coast	*295,350*	.....	*237,150*
Southwest Texas	*62,050*	.....	*58,600*
Wyoming	92,830	98,300	92,800
Total United States	3,565,495	3,474,500	3,345,835
Total production Jan. 1-May 9, 1942	519,665,260 bbl.		
Same period last year	466,035,280 bbl.		

With these conditions in mind many operators are hopeful that some relief will be forthcoming through a resumption of part of the normal tanker transportation from the Gulf Coast to the Atlantic seaboard. The fact that this resumption offers the quickest and by far the most economical method of ameliorating the extremely critical situation facing eastern petroleum consumers and also of bringing a return to more normal operations elsewhere, is apparent from all the studies that have been made. It is claimed a convoy movement of tankers plus protection from land through air patrols could be accomplished without taking a large number of naval and air units from other services. While official Washington has indicated that domestic petroleum operations must be adjusted to the possibility that coastal transportation will not be resumed for the duration, there are those who are confident that partial relief will come within 60 to 90 days. In the meanwhile the spread of motor-fuel rationing to all states is in prospect.

Natural-Gasoline Plants Are Reflecting Influence of War

By H. STANLEY NORMAN

ACCELERATION of the trend to recover products having particularly desirable characteristics for war purposes is the outstanding development in this year's natural-gasoline operations. This course is charted by changes now taking place and in prospect for all classes of motor fuel. Conversion of the entire petroleum industry from basic production of 70-85 octane fuel to the manufacture of 91-100 octane grades is sweeping the natural-gasoline manufacturers along with crude-oil refiners and producers.

Basic changes in operating technique demanded by the necessity of producing aviation motor fuel, synthetic rubber and other commodities connected with the war this week engaged attention of engineers and executives in Tulsa at the annual meeting of the Natural Gasoline Association of America, May 14-15.

Reviews of developments within the industry and the discussions presented before general meetings and committee conferences during the N.G.A.A. convention magnify evolvement of a more complex manufacturing technique. Recovery of higher percentages of butane, propane, pentane, and their isomers has been an obvious trend in natural-gasoline operations for several years but manufacturers are considering the various aspects of conditions that may force or make desirable complete separation of such fractions.

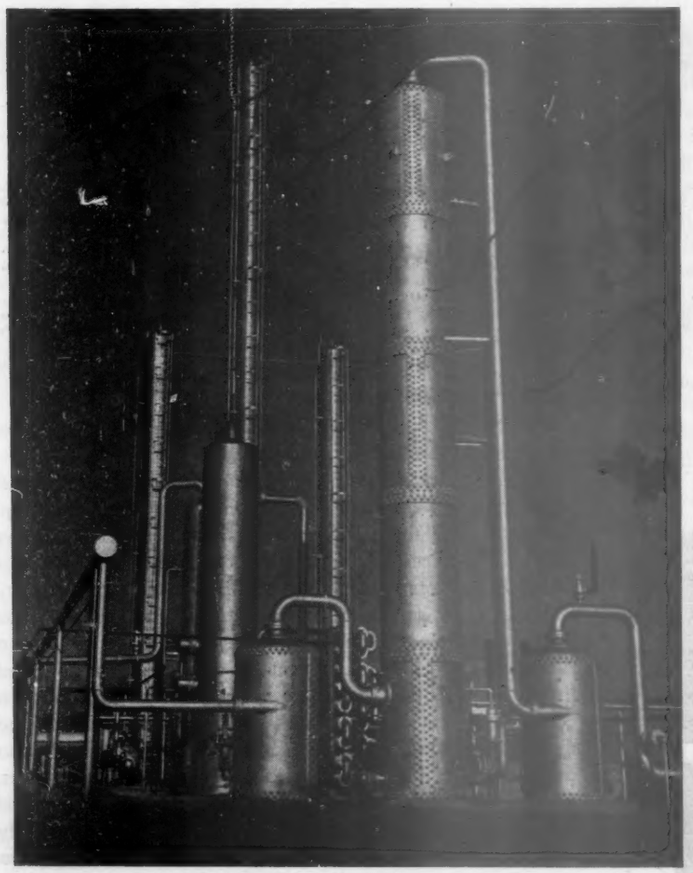
DISTRIBUTION OF LIQUEFIED PETROLEUM GAS CAPACITY

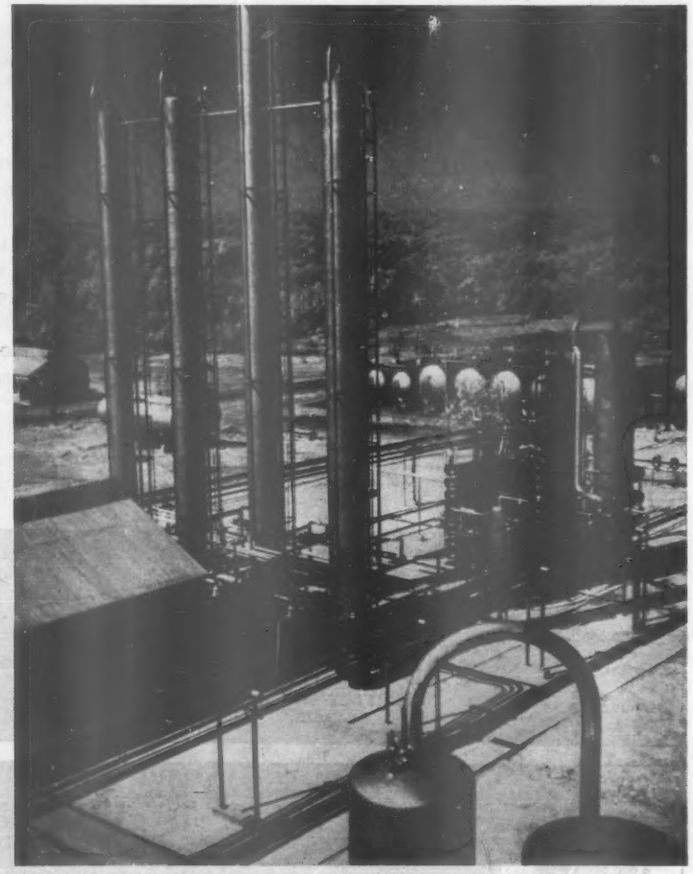
	No. of plants recovering L.P.G.	Daily capacity (gal.)
Arkansas	1	20,000
California	16	307,500
Illinois	4	142,014
Kansas	4	36,000
Kentucky	1	7,000
Louisiana	7	85,000
Montana	1	9,000
New Mexico	4	60,000
Oklahoma	21	180,850
Pennsylvania	3	4,550
Texas	31	701,105
West Virginia	4	60,000
Wyoming	2	17,000
Undistributed (est.)	40	1,700,000
Total	139	3,330,019

Higher and steadier demand for fractions from butane down to pentane with relatively more stable prices are influencing natural-gasoline-plant operators to install equipment for recovery of these hydrocarbons wherever the expenditure can be justified and when the necessary equipment can be obtained. The natural-gasoline industry is passing through a period of uncertainty as regards the functions it will be called upon to perform in the war program. There are indications, however, that natural-gasoline manufacturers will be eventually called upon to supply relatively high percentages of their butane for conversion into aviation-fuel alkylate, isobutylene, butadiene, and toluene.

An increase of more than 100,000 gal. in the daily productive capacity of the country's natural-gasoline plants, disclosed by the annual survey of The Oil and Gas Journal, reflects some of the basic changes occurring in the industry's operations.

Part of the increase in natural-gasoline-producing capacity is traceable to substantial improve-





Left: Absorber and fractionating towers for the close separation required in modern natural-gasoline plant operation. Right: Equipment for recovery of all products essential to the war program is included in Warren Petroleum Corp.'s new plant in Oklahoma

DISTRIBUTION OF PLANT CAPACITIES AMONG STATES

	Number of plants		Daily natural-gasoline capacity in gallons	
	1942	1941	1942	1941
Arkansas	8	9	106,300	120,000
California	87	96	2,905,700	3,033,500
Colorado	1	2	6,000	7,000
Illinois	12	26	356,200	151,790
Kansas	13	14	349,300	378,500
Kentucky	3	3	50,000	51,500
Louisiana	29	28	635,775	609,000
Michigan	2	3	15,000	25,000
Montana	1	1	18,000	7,000
New Mexico	8	7	364,000	352,000
Ohio	7	11	48,000	48,640
Oklahoma	91	105	1,868,665	1,912,050
Pennsylvania	67	73	147,245	143,245
Texas	149	144	4,054,300	3,949,800
West Virginia	77	80	328,890	348,860
Wyoming	8	7	123,100	138,100
Detail total	563	609	11,376,475	11,275,985
Undistributed*	43	...	4,500	.....
Grand total	606	609	11,380,975	11,275,385

*Plants in this classification are mostly small units used primarily for recovering lease-operation products.

ment in market conditions prevailing during the last 6 months of 1941, particularly in the final quarter. The price of 26-70 material (Group 3) held steady at 5.125 cents per gallon from the early part of last October until the latter part of January 1942.

Interruption of coastwise-tanker operations blocked normal movement of natural gasoline along with other petroleum products. The smaller volume of natural-gasoline operations with concomitant inflexibility of storage facilities precipitated a more violent market reaction than in most other products. In a period of 5 weeks, the base price of natural gasoline skidded from 5.125 cents per gallon on January 20 to 2.25 cents on February 24, a drop of 2.875 cents.

Prevelance of relatively high prices for 3½ months at the end of last year and the first of this doubtless influenced the continued operation of certain plants. But probably the most pertinent factor is the prospect that the war program will open up new requirements for products of natural-gasoline-plant operations and the likelihood that prices for such materials would provide reasonable profit.

Fewer Plants, Larger Capacity

The Journal's detailed survey of natural-gasoline plant locations and capacities shows a total of 606 installations with combined capacity of 11,380,975 gal. per day. The comparable survey in 1941 contained 609 plants with total capacity of 11,275,985 gal. daily. Comparison of the total figures in the two surveys shows that the trend is continuing toward fewer but larger plants. Capacity of the average plant now in operation is 18,780 gal. daily, a slight increase over the average of 18,500 gal. at the same period last year. The average plant capacity is hardly representative, however, because most installations in the eastern fields which, from a numerical standpoint are substantial, are not qualified to recover more than lease-fuel requirements.

A more significant correlation of natural-gasoline operations is given by comparing Bureau of Mines figures for 1940 and 1941. The bureau reported daily average production of 6,358,000 gal. daily during 1940 and this was increased to 7,388,000 gal. daily in 1941, a gain of more than 16 per cent.

The rate of natural-gasoline production reported at 10,145,000 gal. in January and 10,152,000 gal. in February is not entirely comparable with previous periods. Starting last January, the bureau production figures include all of the liquefied petroleum gases made at reporting natural-gasoline plants. Consequently, the increase of nearly 40 per cent in January and February production over the average for the previous year is distorted to whatever extent 1941 reports were deficient in reflecting liquefied-petroleum-gas manufacture. The difference of 2,757,000 gal. in the daily average of 1941 production reported by the bureau and the high total of 10,145,000 gal. daily in January this year would indicate that little, if any, of the condensate and liquefied petroleum-gas production were included in statistics prior to 1942.

An accurate demarcation between operations of condensate-recovery, natural gasoline and pressure-maintenance plants is growing more difficult with the passage of time. Basic operations in the various classifications of light-product recov-

(Continued on Page 92)

NATURAL-GASOLINE PRODUCTION
(Bureau of Mines figures)

	Daily production (Thousands of gals.)	
	1941	1942
January	6,617	10,145
February	6,848	10,152
March	6,660	.....
April	6,972	.....
May	7,019	.....
June	7,133	.....
July	7,166	.....
August	7,540	.....
September	7,930	.....
October	8,064	.....
November	8,392	.....
December	8,240	.....

OTHER LIGHT PRODUCTS
(Figures in thousands of gallons)

	1942	
	January	February
Condensate	61,362	54,684
Isobutane	10,080	9,156
Liquefied petroleum gas	63,126	51,578
Total	134,568	115,416
Daily average	4,341	4,122

OTHER NATURAL GASOLINE FEATURES IN THIS ISSUE

- **Annual survey of natural gasoline and condensate-recovery plants starting on Page 85.**
- **Report on testing of high-pressure gases, starting on Page 62.**
- **Methods for increasing recovery of liquefied petroleum gas in natural-gasoline plants, starts on Page 66.**
- **Pertinent remarks of Robert E. Allen, assistant deputy coordinator, announcing elevation of natural gas and natural-gasoline section of OPC to full division status, Page 36.**

Crude Runs of 3,697,000 Bbl. Daily Proposed by Bureau of Mines

Average crude runs of 3,697,000 bbl. daily during May was suggested last week by the Bureau of Mines as the requirements to provide total refinery production of 46,990,000 bbl. of straight-run and cracked gasoline. The forecast of necessary crude runs is 17,000 bbl. daily higher than for April but 155,700 bbl. below the actual for May 1941.

Total demand for motor fuel in May is estimated at 56,700,000 bbl., a reduction of 4,200,000 bbl., or 7 per cent, compared with the actual requirements in May 1941. This estimated decrease reflects restricted use of motor vehicles to conserve tires and also anticipates the effect of restricted deliveries of gasoline to distributors in the East Coast and Pacific Northwest.

Benzol production and direct sales of natural gasoline are estimated at 1,500,000 bbl., making an indicated refinery production of 41,300,000 bbl., distributed among the various refining districts.

Natural gasoline to be blended at refineries is estimated at 4,310,000 bbl. The increasing need for heavy fuel oil for powering the defense industries, notwithstanding the declining demand for motor fuel, will make it necessary for the industry to severely readjust the product yields from crude oil in order to supply the fuel-oil demand and, at the same time, prevent accumulation of unmanageable stocks of gasoline, the bureau warned. The bureau, in line with calculated increases in fuel-oil demand, estimated gasoline yield at 41 per cent of crude during May.

Refinery operating forecasts are geared to crude requirements of 3,729,000 bbl. daily.

SUMMARY OF FORECASTS FOR MAY 1942

(Data in thousands of barrels)

	1942 Forecast		Actual
	May	April	May 1941
Demand for motor fuel:			
Domestic demand	.....	.....	59,307
Exports	.....	.....	1,588
Total	56,700	55,700	60,895
Supply of motor fuel:			
Straightrun and cracked gasoline production	46,990	47,470	52,789
Natural gasoline used at refineries	4,310	4,630	3,399
Total refinery production	51,300	52,100	56,188
Benzol and other natural gasoline	1,500	1,300	1,718
Decrease in finished stocks	3,900	2,300	2,989
Available supply	56,700	55,700	60,895
Crude-oil requirements:			
Per cent yield of gasoline from crude	41.00	43.00	44.20
Refinery crude required	114,600	110,400	119,435
Daily average	3,697	3,680	3,853
Foreign crude runs	3,000	3,200	3,880
Exports	4,000	4,700	4,339
Fuel and losses			1,503
Total demand for domestic crude	115,600	111,900	121,397
Daily average	3,729	3,730	3,916
Decrease in domestic stocks	.....	.....	4,421
Actual production	.....	.....	116,976
Daily average	.....	.....	3,773

The term "motor fuel" as used in this report includes gasoline, naphtha, and benzol used for all purposes, but does not include heavier distillates used in the operation of tractors or burned in diesel engines.

Ray Miller, vice president, Hanlon-Buchanan, Inc., and president of the Natural Gasoline Association of America; D. E. Buchanan, president, Hanlon-Buchanan, Inc., and OPC director of natural gas and natural gasoline in District 3; William B. Stout, president, Stout Engineering Laboratories, Inc., banquet speaker; C. R. Musgrave, vice president of Phillips Petroleum Co. and chairman of the OPC District 2 subcommittee on tank cars and trucks

Tank-Car Restrictions Chief Topic at N.G.A.A. Meeting

GENERAL operating problems competed this week with technical sessions for the interest of manufacturers from all parts of the country attending the annual meeting of the Natural Gasoline Association of America in Tulsa May 14-15.

One of the most immediate problems which threatens to affect the operations of practically every manufacturer in the business is the order from the Office of Defense Transportation prohibiting the use of tank cars, unless exception is obtained, for movement of products distances of less than 100 miles. Aim of the order is to force shippers to use tank trucks on hauls of less than 100 miles, freezing the railroad equipment for longer routes on which use of highway vehicles is impractical.

Natural-gasoline manufacturers are particularly concerned over effect of the order on transportation of volatile products. Special tank cars are used for transporting much of the natural-gasoline and liquefied-petroleum gases from plants to refineries or points of consumption that would be prohibited under the ODT order unless exception is granted. Clarification of many of the confusing regulations issued from Washington was the aim in arranging the Friday afternoon program.

D. E. Buchanan, president of Hanlon-Buchanan, Inc., and OPC director of the natural gas and natural gasoline division in District 3; C. R. Musgrave, vice president of the Phillips Petroleum Co. and chairman of the OPC District 2 subcommittee on tank cars and trucks, and Justine Wolfe, OPC attorney, natural gas and natural gasoline section, addressed the meeting Friday afternoon. All three men have spent much time in Washington during recent months and their papers were prepared with the purpose of clarifying position of the natural-gasoline industry in the war program. Ray Miller, vice president of Hanlon-Buchanan, Inc., and this year's president of N.G.A.A., presented a review and forecast of the industry in the presidential address Friday night.

Fuels of Future Discussed

Featured speaker at this year's N.G.A.A. convention banquet was William B. Stout, president of Stout Engineering Laboratories, Inc., Detroit, Mich., whose remarks were off the record and extemporaneous. He attempted, however, to give an insight on the motor-fuel caliber in the post-war period and predicted that automotive engineering progress will demand gasoline qualities that are equal to and probably higher than present aviation standards.

Seven technical papers were presented Thursday and Friday morning. They dealt with practically every phase of modern operations in natural-gasoline plants.

H. L. Oder, Cities Service Oil Co., Bartlesville, Okla., and chairman of the gas testing committee presented a report on the revised charcoal testing method and recommendations for reclaiming both charcoal and glycerin.

New standard tables of physical constants for the principal hydrocarbons and a new alternate standard for determining the specific gravity of liquefied petroleum gases by the hydrometer method were presented by H. H. Beeson, Sabine Valley Gasoline Co., Inc., chairman of the technical committee.

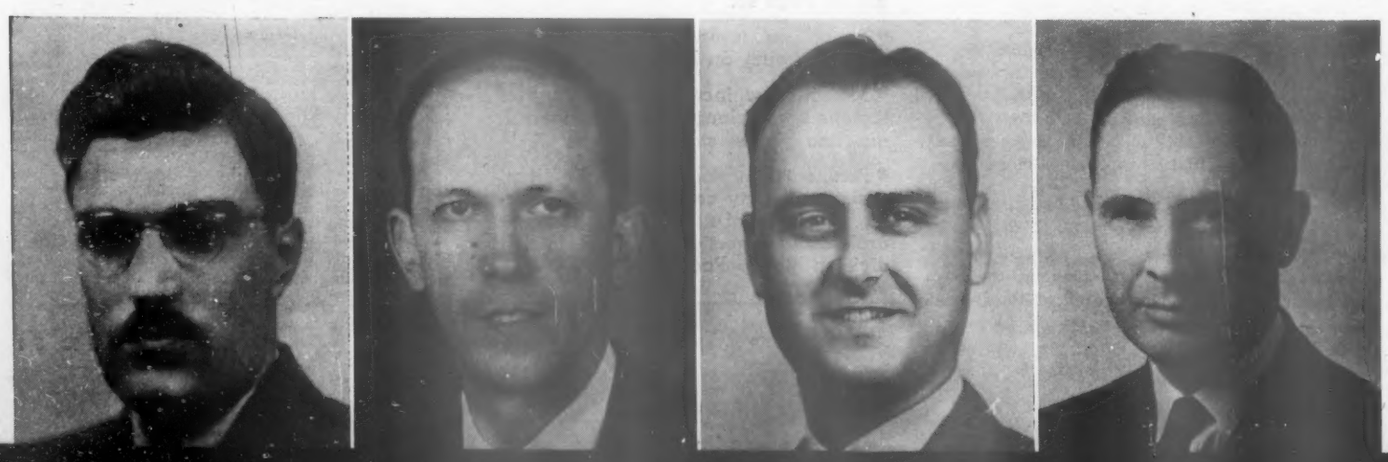
B. R. Carney, Shell Oil Co., Inc., presented another technical committee report dealing with experiments to determine actual densities at a wide range of temperatures having in mind the establishment of new volume temperature-correction factor for liquefied petroleum gases.

Results of 2 years of committee research seeking elimination of errors in fractional distillation of gases were presented by H. A. Montgomery, Hanlon-Buchanan, Inc. Recommendations were presented for changes in procedure and apparatus to obtain greater accuracy and duplicability of results.

Dr. Donald L. Katz, University of Michigan, gave a paper Friday morning recommending standardized calculations of deviations from Boyle's law, high-pressure orifice-meter measurement and supercompressibility factors.

Entertainment highlight was the general mixer and buffet dinner Thursday night arranged by the Natural Gasoline Supply Men's Association.

Dr. Donald R. Katz, University of Michigan; H. H. Beeson, vice president, Sabine Valley Gasoline Co., Inc.; C. H. Gee, La Gloria Corp., and B. R. Carney, Shell Oil Co., Inc., all speakers on the technical program



This Week...

Washington grapevine says P-98 will be extended beyond May 15 without much change.

Bureau of Mines forecasts 7 per cent decrease this month in motor-fuel demand, compared with last May. Suggests gasoline yield of 41 per cent on crude.

California company suffers first penalty for alleged violation of M-68. Denied priority assistance for 3 months, told to shut in offending well for same period.

Office of Defense Transportation takes control of all tank cars June 1. Original order specified May 15 as effective date. Protests of shippers gain delay.

Petroleum inshipments to the East Coast hit new peak of 640,478 bbl. daily. Joint subcommittees in Districts 1, 2 and 3 directed to make arrangements for further increases.

Leon Henderson, director of rationing, sets 3 gal. per week as minimum gasoline-supply unit for eastern area, effective May 15 to July 1.

Petroleum Industry War Council asks for elimination of overlap and duplication of orders, questionnaires, etc., from various government agencies.

Sinkings of two freighters in Gulf of Mexico increased the caution in movement of tankers, heightened interest in inland waterways.

Natural-gasoline manufacturers assemble in annual meeting. Chief lobby discussion concerns tank-car restrictions imposed by Defense Transportation Director Eastman. Operators fear minimum tank-car hauls will hit liquefied petroleum gas deliveries particularly hard.

Reconstruction Finance Corporation reported listening with sympathetic ear for loan applications from oil companies. Industry still wary of subsidy. Unbearable transportation costs weakening resistance.

Price Administrator Henderson says ceilings will not be so restrictive as to drive business to bankruptcy. Simultaneously declares March base is adequate, an issue railroad oil shippers could debate.

Texas Railroad Commission sets crude-oil allowable for last half of May at rate of 1,400,000 bbl. daily, ignoring recommendation of OPC which had proposed top of 960,000 bbl.

Atlantic reverses western leg of Keystone products line, to effect crude deliveries at Point Breeze, Pa., refinery. Tuscarora involved in similar program for delivering 20,000 bbl. daily to Bayonne, N. J., drawing crude from old systems now being looped, reconditioned and joined.

OPC Delegates Power to Relieve Fuel-Oil Crisis

WASHINGTON, D. C.—Rearrangement of refinery runs and tank-car shipments in order to get more heavy fuel oil into the East Coast area was ordered May 11 by the Office of Petroleum Coordinator for War.

A sweeping program, ordered in Petroleum Directive 50, calls for the release of 30 per cent of the tank cars used in OPC Districts 1, 2 and 3 for this movement. The directive limits use of tank cars and pipe lines for local distribution, rearranges supply disbursements in the Southeast, including Alabama and Mississippi, affects deliveries to rail terminals on the west coast of Florida, and stipulates a number of other drastic provisions.

The program (embraced in Petroleum Directive 50) provides for:

1. Formation of a joint tank-car subcommittee for the East, Middle West and Gulf Coast districts, "charged with the responsibility of obtaining maximum efficiency in the use of all tank cars employed by the petroleum industry, assuring that such tank cars are utilized to meet the critical problems of petroleum supply in each district."

2. Movement of 75,000 additional barrels of heavy fuel oil daily from the Gulf Coast and 75,000 bbl. daily from the Middle West.

3. Arrangement of East Coast refinery operations so that minimum amounts of crude oil shall be used by refineries which are making petroleum war products; and so that heavy fuel-oil production will be increased at the expense of gasoline.

4. Apportionment of crude supplies among East Coast refiners so that all shall receive amounts in proportion to their runs during the last 6 months of 1941.

5. Movement of an additional 100,000 bbl. of East Texas crude oil daily into District 1 in order that refinery operations in this area may be maintained at 400,000 bbl. per day.

6. Movement of 10,000 additional barrels of gasoline daily into the East by Great Lakes tankers.

7. Supplying of the southeastern states from points of entry on the Gulf Coast and the Mississippi River.

8. Utilization of rail facilities for movement of at least 100,000 bbl. of oil daily up the Atlantic seaboard from the South.

Chairmen to Name Committee

Pertinent portions of Petroleum Directive 50, follow:

§ 1510.1. *Designation of joint tank-car subcommittee.* The chairmen of the transportation committees for Districts 1, 2 and 3 shall designate, with the approval of the petroleum coordinator for war or the deputy petroleum coordinator, a joint tank-car subcommittee for Districts 1, 2 and 3, comprised of two members for each of said districts, which subcommittee shall be charged with the responsibility of obtaining maximum efficiency in the use of all tank cars employed by the petroleum industry and of assuring that such tank cars are utilized to meet the critical problems of petroleum supply in each district. The director of transportation for District 2 shall sit with the subcommittee as advisor and consultant in all deliberations of the subcommittee and shall act as liaison officer between the director of transportation of the Office of Petroleum Coordinator and the subcommittee.

These chairmen of transportation in Districts 1, 2, and 3 will appoint members of the joint tank-car subcommittee. They are: left, W. A. Jones, president, Cities Service Co.; below: left, E. G. Seubert, president, Standard Oil Co. (Indiana), and Harry C. Wiess, president, Humble Oil & Refining Co.

§ 1510.2. *Surveys and investigations.* The joint tank-car subcommittee for Districts 1, 2 and 3, shall make such surveys and investigations and shall obtain such information with respect to the use and location of tank cars as may be necessary or desirable to accomplish the objectives specified in § 1510.1 of this chapter. All users of tank cars in the petroleum industry in Districts 1, 2 and 3 shall furnish such information to the subcommittee promptly upon request.

§ 1510.3. *Release of tank cars by users thereof.* In order to provide tank cars for the movement of petroleum and petroleum products as hereinafter in this directive described, the joint tank-car subcommittee shall prepare schedules providing for the release of up to 30 per cent of the tank-car capacity, whether loaded or empty, in use by or available to each user of petroleum products tank cars in the petroleum industry in Districts 1, 2 and 3, at noon on May 4, 1942, provided, that tank cars designed to transport liquefied petroleum gases, acid, or otherwise not suitable for general petroleum-transportation service, and tank cars in service from Districts 2 and 3 into District 1 shall be excluded from all calculations hereunder. After approval of any such schedule by the chief counsel of the Office of Petroleum Coordinator for war, in accordance with the provisions of § 1510.12 of this chapter, each user shall, upon notice from the joint tank-car subcommittee, release such tank cars in accordance with the said schedule for use in the movement directed herein.

§ 1510.4. *Supervision of tank-car operations.* The subcommittee shall thereafter investigate the loading, unloading, routing, and handling of all tank cars used in petroleum service in Districts

1, 2 and 3 and make appropriate recommendations to the owners, users, and handlers of such tank cars to the end that maximum efficiency of tank cars in appropriate supply services may be attained.

District 3 Relief Provided

§ 1510.5. *Heavy fuel oil from District 3.* In order to increase the supplies of heavy fuel oil in the East Coast area (U. S. Bureau of Mines district, hereinafter referred to as "East Coast area") and to provide an outlet for Gulf Coast refineries sufficient to enable such refineries to continue operations, a movement by tank car of 145,000 bbl. per day of heavy fuel oil (approximately 75,000 bbl. per day in excess of present movement) from Gulf Coast refineries to the East Coast area shall be arranged as follows:

1. The transportation committee for District 3 shall prepare a monthly schedule, including specific points of origin, of tank-car loadings of heavy fuel oil of a quality which will permit handling in uncoiled tank cars to be shipped to the East Coast area. Such schedules shall be prepared in strict accordance with the provisions of the "Plan for the Formulation of Refinery Operating Program and the Distribution of Transportation Outlets in District 3" devised, approved, and directed to be put into operation pursuant to Recommendation 33, as amended. The schedules shall be filed by the transportation committee for District 3 with the supplies and distribution subcommittee for District 1.

2. Each person, natural or artificial, engaged in the business of manufacturing heavy fuel oil within the East Coast area and each person bringing heavy fuel oil or causing heavy fuel oil to be brought into the East Coast area shall purchase during each calendar month a proportionate share of the fuel oil to be shipped during such month hereunder by tank car from District 3, which shall be at least the same percentage as that which the individual's volume of sales of heavy fuel oil was of the total of all sales of heavy fuel oil made in the East Coast area during the last 6 months of 1941 by all East Coast suppliers of heavy fuel. The calculation and assignment of each such person's share of fuel oil shall be made by the supplies and distribution subcommittee for District 1 and embodied in a monthly schedule showing specific destinations. Each such person shall furnish such supplies and distribution subcommittee with all information necessary for this purpose. The supplies and distribution subcommittee of District 1 shall furnish complete information as to such monthly schedules to the joint tank-car subcommittee for Districts 1, 2 and 3.

3. The joint tank-car subcommittee for Districts 1, 2, and 3 shall secure the necessary tank cars in accordance with the provisions of § 1510.3 of this chapter and arrange for the use of such cars in the service of moving such fuel oil from locations determined pursuant to Subsection 1510.5 (1) hereof to destinations in the East Coast area named by the purchasers determined pursuant to Subsection 1510.5 (2) hereof.

§ 1510.6. *Heavy fuel oil from District 2.*—In order to increase supplies of heavy fuel oil in the East Coast area from sources nearest to such area so that the efficient use of transportation facilities may be increased, a movement by tank car of 125,000 bbl. per day of heavy fuel oil (approximately 75,000 bbl. per day in excess of present movement) from District 2 refineries to the East Coast area shall be arranged as follows:

1. Subject to the direction of the director of refining, Office of Petroleum Coordinator for War, the refining committee for District 2 shall establish a schedule for fuel-oil production for each refinery in District 2, requiring necessary increases in the yield of heavy fuel oil and corresponding decreases in the yield of motor gasoline so that heavy fuel oil of a quality which will permit handling in uncoiled tank cars shall be made available in the quantity required for such movement.

2. The supplies and distribution subcommittee for District 2 shall, subject to the direction of the director of supply of the Office of Petroleum Coordinator for War or such district director as he may designate, arrange for purchases, sales, exchanges, and loans of heavy fuel oil among those engaged in the petroleum industry in District 2 in all cases where such transactions will result in concentrating supplies of such heavy fuel oil for such movement at points in District 2 where full train-load lots may be loaded.

3. The supplies and distribution subcommittee for District 2 shall, in accordance with the provisions of Subsection 1510.6 (1) and (2) hereof, prepare and submit to the supplies and distribution subcommittee for District 1 a monthly schedule, including specific points or origin, of tank car loadings of heavy fuel oil of a quality which will permit handling in uncoiled tank cars to be shipped to the East Coast area from such locations in District 2. The supplies and distribution subcommittee for District 1 shall furnish complete information as to such monthly schedules to the joint tank-car subcommittee for Districts 1, 2, and 3.

4. Each East Coast supplier of heavy fuel oil shall purchase a proportionate share of the heavy fuel oil to be shipped by tank car from District 2. The share of each such supplier shall be calculated and assigned as provided in Subsection 1510.5 (2) of this chapter and embodied in a monthly schedule showing specific destinations.

5. The joint tank-car subcommittee for Districts 1, 2, and 3 shall secure the necessary tank cars in accordance with the provisions of § 1510.3 of this chapter and arrange for the use of such cars in the service of moving such fuel oil from locations determined pursuant to Subsection 1510.6 (3) hereof to destinations in the East Coast area named by the purchasers determined pursuant to Subsection 1510.6 (4) hereof.

Maximum Fuel Yield Sought

§ 1510.7. *Refinery operations: District 1.*—In order to maintain production of petroleum war products in refineries in the East Coast area at required levels, and at the same time both to increase the supply of heavy fuel oil and distribute equitably the available crude-oil supplies to all refineries operating in such area, the refining committee for District 1 shall prepare, pursuant to the provisions of Recommendation 33, as amended, a plan for refinery operation in District 1 which shall assign levels of crude-oil runs in each refinery in such a manner that:

1. Required production of petroleum war products shall be maintained with a minimum of crude-oil runs in plants producing such war products in accordance with a monthly determination by the director of refining, Office of Petroleum Coordinator for War, specifying the petroleum war products the production of which are necessary at stated or maximum rates in District 1.

2. Crude-oil supplies currently available to refineries in the East Coast area shall be assigned to all refineries in this area in such a manner that each refinery will have available, insofar as consistent with Subsection 1510.7 (1) hereof, the same percentage of the total available current crude-oil supplies as the percentage which such refinery's crude-oil runs in the East Coast area is to the total crude-oil runs of all refineries in the East Coast area during the last 6 months of 1941.

The plan shall provide that all refineries in the East Coast area shall produce the maximum quantity of heavy fuel oil and a minimum quantity of motor gasoline insofar as consistent with Subsection 1510.7 (1) hereof.

East Texas Shipments Provided

§ 1510.8. *Crude oil from East Texas.*—In order to increase supplies of crude oil in the East Coast area so that total refinery runs of 400,000 bbl. per day may be maintained in East Coast refineries and to provide an outlet for East Texas crude oil so that supplies of isobutane required for petroleum war products may be maintained, arrangements shall be made as follows:

1. The refining committee for District 1 shall arrange for a movement by tank car of 100,000 bbl. per day of East Texas crude oil, in addition to that now being so moved, and prepare a monthly schedule of such movements showing specific points of loading.

2. The refining committee for District 1, in strict accordance with the provisions of § 1510.7 of this chapter, shall calculate and assign to each refiner in the East Coast area a proportionate share of the additional crude oil to be brought into the East Coast area from East Texas, and compile therefrom a monthly schedule showing specific destinations. Each refiner in the East Coast area shall purchase and bring into District 1 such proportionate share of such additional crude oil. The refining committee for District 1 shall furnish complete information as to such monthly schedules to the joint tank-car subcommittee for Districts 1, 2, and 3.

3. The joint tank-car subcommittee for Districts 1, 2, and 3 shall secure the necessary tank cars in accordance with the provisions of § 1510.3 of this chapter and arrange for the use of such tank cars in the service of moving crude oil pursuant to Subsection 1510.8 (1) hereof to destinations in the East Coast area named by the purchasers determined pursuant to Subsection 1510.8 (2) hereof.

§ 1510.9. *Gasoline: Lake tanker movement.*—In order to increase supplies of motor gasoline moving into District 1 by lake tanker by at least 10,000 bbl. per day in excess of present movements, arrangements shall be made as follows:

1. The supplies and distribution subcommittee for District 2 shall, subject to the direction of the director of supply of the Office of Petroleum Coordinator for War or of such district director as he may designate, arrange for purchases, sales, exchanges, and loans of motor gasoline among those engaged in the petroleum industry in District 2 so as to make sufficient supplies of motor gasoline of an appropriate quality available for shipment by lake tanker into the Buffalo, New York area of District 1 and shall notify the supplies and distribution subcommittee for District 1 of supplies available for such shipment.

OPC Instructions Now Called "Directives"

WASHINGTON, D. C.—The term "Petroleum Directive" has been added to the oil industry's wartime lexicon. It replaces "Formal Recommendation" in describing the orders of the Office of Petroleum Coordinator.

This easier and more accurate term appears for the first time on the fiftieth set of instructions issued by OPC. From the time the OPC was created nearly a year ago, the oil industry has been following its formal recommendations as though they were legally binding orders, and since Pearl Harbor they have been considered fully mandatory under the war powers of the executive.

2. The supplies and distribution subcommittee for District 1 shall notify all primary marketers of motor gasoline in the Buffalo area of the availability of such supplies.

§ 1510.10. *Gasoline: Supply sources of Southeast.*—In order to maintain supplies of motor gasoline for the states of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi (hereinafter referred to as the Southeastern area) and release tank cars for moving petroleum and petroleum products into the North Atlantic area, the following arrangements shall be made:

1. The supplies and distribution subcommittee for Districts 1 and 3 shall, subject to the direction of the director of supply of the Office of Petroleum Coordinator for War or such district director as he may designate, arrange for purchases, sales, exchanges, and loans of motor gasoline among those engaged in the petroleum industry in Districts 1 and 3 so that the entire supply of motor gasoline for consumption in the southeastern area shall be obtained through points of entry on the Mississippi River and the Gulf of Mexico.

2. The supplies and distribution subcommittee for Districts 1 and 3 shall devise a plan or plans pursuant to Recommendation 33, as amended, to accomplish the above objective. Such plan or plans shall include provisions for:

(*i*) The common use of river and Gulf bulk terminals by all primary suppliers of petroleum products in this area, regardless of ownership of such terminals.

(*ii*) Limitation on use of pipe lines for local distribution purposes to the end that the maximum use of such pipe lines shall be made to supply the most northerly and easterly portions of this area.

(*iii*) Limitation or elimination of the use of tank cars for local distribution of petroleum products within this area.

Florida Route Specified

§ 1510.11. *Plan for Florida movement.*—The supplies and distribution subcommittee for District 1 shall, pursuant to Recommendation 33, as amended, devise a plan for the movement of at least 100,000 bbl. per day of petroleum and petroleum products, by tanker or barge from the Gulf Coast area of Texas and Louisiana to ports on the West Coast of Florida, thence by tank car to points of distribution in District 1 or to storage at Norfolk, Va., for transshipment by tanker, barge, or other transportation methods to points of distribution in District 1. Such plan shall be submitted by such committee to the chief counsel of the Office of Petroleum Coordinator for War on or before May 15, 1942.

§ 1510.12. *Effectuating plans and schedules.*—The committees and subcommittees referred to in § 1510.3 to § 1510.11, inclusive, of this chapter, and all persons affected by any plan or schedule formulated in accordance with said sections shall, upon the approval of any such plan or schedule by the chief counsel of the Office of Petroleum Coordinator for War, carry into effect such plan or schedule according to its terms, conditions, and intent.

§ 1510.13. *Reports.*—Each committee or subcommittee affected by this directive shall file a weekly progress report with the chairman of the general committee for the appropriate district. A copy of all reports, schedules, or other documents prepared pursuant to the terms of this directive shall be forwarded to the appropriate director in the Office of Petroleum Coordinator for War.

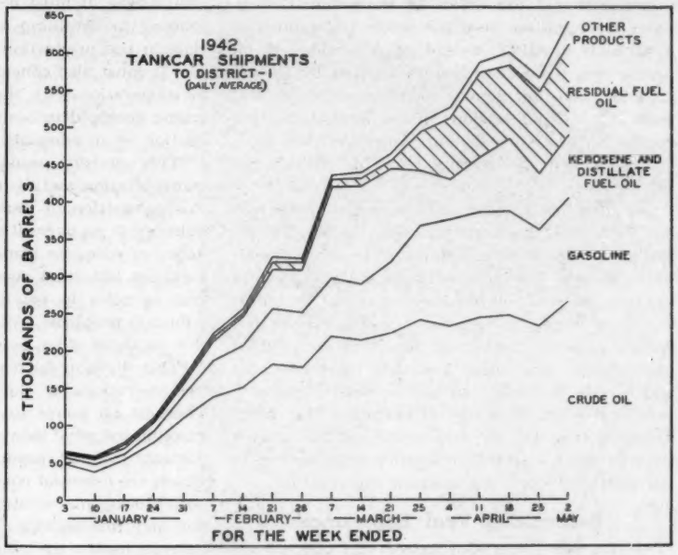
§ 1510.14. *Expenses.*—Any expenses incurred by any committee or subcommittee pursuant to the operation of this directive shall be defrayed by the appropriate general committee pursuant to the provisions of Recommendation 7.

Heavy Fuel-Oil Delivery Still Short of Demands

By J. P. O'DONNELL

NEW YORK.—In its attempt to meet the critical demand for heavy fuel oil in the northeastern area, the oil industry has stepped up shipments of this product by tank car in the last 3 weeks more than 130 per cent above the preceding 3 weeks but still is short of meeting requirements. In an attempt to meet the deficiency, efforts are being made to obtain an additional 14,000 tank cars to be used exclusively for the transportation of residual fuel oil.

This step probably will necessitate the withdrawal of cars from the transportation of other products and thus will result in the curtailment of shipments of gasoline, asphalt, etc. However, the need for residual fuel oil has given it preference over all other products and every effort will be made to meet demands of industries dependent on it. The use of cars not equipped with coils will require the use of greater quantities of higher-priced light fuel oil and thus will add further to the already tremendous cost the industry is bearing in supplying District 1 by rail.



Fuel oil dominates rise of tank-car oil movement

Loading of residual fuel oil in the week ended May 2 averaged 121,275 bbl. per day. In the last 3 weeks the average has been 110,500 bbl. per day against 47,600 bbl. in the preceding 3 weeks.

This graph also shows the remarkable progress made by the railroads and the oil industry in meeting this problem. An even better picture of this progress is shown by a comparison of tank-car shipments for the week ended January 10 with those of the week ended May 2 which follows:

(Data in barrels per day)

Product—	Jan. 10	May 2	Per cent gain
Crude oil	38,346	264,677	590
Gasoline	9,611	138,857	1,345
Kerosene, etc.	6,653	85,404	1,184
Residual	2,282	121,275	5,214
Others	1,832	30,265	1,552
Total	58,724	640,477	990

The effect of more costly transportation on the oil companies is not indicated in most first-quarter reports which cover the entire 3-month period as a unit. However, one, the Atlantic Refining Co., broke down its earnings by months, thus providing a picture of how the increasing volume of rail shipments is affecting it. This shows per share earnings, before taxes, of $1.02 for January, 27 cents for February and a loss of 47 cents for March.

"This deterioration in operating results was primarily due to increasing costs of transportation without compensating increases in prices of our products," the report states. "War-risk insurance on tankers, slower turnabout of ships and the relatively high cost of transportation by tank car added approximately $1 per barrel to the cost of delivering crude oil to our Point Breeze refinery. In addition, our refining costs increased substantially because, despite our use of all available means of transport, we were forced more and more to operate below refinery capacity."

The relative effect of this condition on the companies participating in the tank-car pool is shown in the following table of the approximate number of cars loaded by each company in the period covering the period from January 3 to April 25

Company—	Cars loaded
American Mineral Spirits	519
Arkansas Fuel Oil Co.	261
Atlantic Refining Co.	15,638
James B. Berry Sons Co.	27
Cities Service Co.	6,920
Continental Oil Co.	1,300
Gulf Oil Corp.	14,413
Hartol Products Co.	546
Pan American P. & T.	14,170
Petrol Corp.	2,321
Petroleum Heat & Power Co.	264
Pure Oil Co.	2,051
Shell Oil Co.	11,475
Sinclair Refining Co.	12,219
Socony-Vacuum Oil Co.	20,557
Standard Oil Co. (Kentucky)	1,487
Standard Oil Co. (New Jersey)	41,691
Sun Oil Co.	9,316
Tide Water Associated Oil Co.	3,873
Texas Co.	19,421
Miscellaneous	77

The highly involved nature of rail transportation is apparent from the fact that at least two of the companies are loading crude oil and refined products at from 40 to 45 points. In addition a considerable portion of it is consigned directly to New England, where the greatest bottleneck is encountered. In the week ended April 25 there were 5,282 cars consigned to New England points representing about 30 per cent that week.

In the same week, 7,250 cars of crude oil were loaded for shipment into District 1. The length of the hauls involved in supplying East Coast refineries from Baltimore to the Boston area is apparent from the following list of states, showing the origin of the crude-oil shipments in that week: Illinois, 1,687 cars; Michigan, 290; Louisiana, 1,732; Mississippi, 1,192; Texas, 678; Ohio, 1,243; Oklahoma, 339; Indiana, 3; western New York, 86.

1, 2 and 3 and make appropriate recommendations to the owners, users, and handlers of such tank cars to the end that maximum efficiency of tank cars in appropriate supply services may be attained.

District 3 Relief Provided

§ 1510.5. *Heavy fuel oil from District 3.* In order to increase the supplies of heavy fuel oil in the East Coast area (U. S. Bureau of Mines district, hereinafter referred to as "East Coast area") and to provide an outlet for Gulf Coast refineries sufficient to enable such refineries to continue operations, a movement by tank car of 145,000 bbl. per day of heavy fuel oil (approximately 75,000 bbl. per day in excess of present movement) from Gulf Coast refineries to the East Coast area shall be arranged as follows:

1. The transportation committee for District 3 shall prepare a monthly schedule, including specific points of origin, of tank-car loadings of heavy fuel oil of a quality which will permit handling in uncoiled tank cars to be shipped to the East Coast area. Such schedules shall be prepared in strict accordance with the provisions of the "Plan for the Formulation of Refinery Operating Program and the Distribution of Transportation Outlets in District 3" devised, approved, and directed to be put into operation pursuant to Recommendation 33, as amended. The schedules shall be filed by the transportation committee for District 3 with the supplies and distribution subcommittee for District 1.

2. Each person, natural or artificial, engaged in the business of manufacturing heavy fuel oil within the East Coast area and each person bringing heavy fuel oil or causing heavy fuel oil to be brought into the East Coast area shall purchase during each calendar month a proportionate share of the fuel oil to be shipped during such month hereunder by tank car from District 3, which shall be at least the same percentage as that which the individual's volume of sales of heavy fuel oil was of the total of all sales of heavy fuel oil made in the East Coast area during the last 6 months of 1941 by all East Coast suppliers of heavy fuel. The calculation and assignment of each such person's share of fuel oil shall be made by the supplies and distribution subcommittee for District 1 and embodied in a monthly schedule showing specific destinations. Each such person shall furnish such supplies and distribution subcommittee with all information necessary for this purpose. The supplies and distribution subcommittee of District 1 shall furnish complete information as to such monthly schedules to the joint tank-car subcommittee for Districts 1, 2 and 3.

3. The joint tank-car subcommittee for Districts 1, 2, and 3 shall secure the necessary tank cars in accordance with the provisions of § 1510.3 of this chapter and arrange for the use of such cars in the service of moving such fuel oil from locations determined pursuant to Subsection 1510.5 (1) hereof to destinations in the East Coast area named by the purchasers determined pursuant to Subsection 1510.5 (2) hereof.

§ 1510.6. *Heavy fuel oil from District 2.*—In order to increase supplies of heavy fuel oil in the East Coast area from sources nearest to such area so that the efficient use of transportation facilities may be increased, a movement by tank car of 125,000 bbl. per day of heavy fuel oil (approximately 75,000 bbl. per day in excess of present movement) from District 2 refineries to the East Coast area shall be arranged as follows:

1. Subject to the direction of the director of refining, Office of Petroleum Coordinator for War, the refining committee for District 2 shall establish a schedule for fuel-oil production for each refinery in District 2, requiring necessary increases in the yield of heavy fuel oil and corresponding decreases in the yield of motor gasoline so that heavy fuel oil of a quality which will permit handling in uncoiled tank cars shall be made available in the quantity required for such movement.

2. The supplies and distribution subcommittee for District 2 shall, subject to the direction of the director of supply of the Office of Petroleum Coordinator for War or such district director as he may designate, arrange for purchases, sales, exchanges, and loans of heavy fuel oil among those engaged in the petroleum industry in District 2 in all cases where such transactions will result in concentrating supplies of such heavy fuel oil for such movement at points in District 2 where full train-load lots may be loaded.

3. The supplies and distribution subcommittee for District 2 shall, in accordance with the provisions of Subsection 1510.6 (1) and (2) hereof, prepare and submit to the supplies and distribution subcommittee for District 1 a monthly schedule, including specific points or origin, of tank car loadings of heavy fuel oil of a quality which will permit handling in uncoiled tank cars to be shipped to the East Coast area from such locations in District 2. The supplies and distribution subcommittee for District 1 shall furnish complete information as to such monthly schedules to the joint tank-car subcommittee for Districts 1, 2, and 3.

4. Each East Coast supplier of heavy fuel oil shall purchase a proportionate share of the heavy fuel oil to be shipped by tank car from District 2. The share of each such supplier shall be calculated and assigned as provided in Subsection 1510.5 (2) of this chapter and embodied in a monthly schedule showing specific destinations.

5. The joint tank-car subcommittee for Districts 1, 2, and 3 shall secure the necessary tank cars in accordance with the provisions of § 1510.3 of this chapter and arrange for the use of such cars in the service of moving such fuel oil from locations determined pursuant to Subsection 1510.6 (3) hereof to destinations in the East Coast area named by the purchasers determined pursuant to Subsection 1510.6 (4) hereof.

Maximum Fuel Yield Sought

§ 1510.7. *Refinery operations: District 1.*—In order to maintain production of petroleum war products in refineries in the East Coast area at required levels, and at the same time both to increase the supply of heavy fuel oil and distribute equitably the available crude-oil supplies to all refineries operating in such area, the refining committee for District 1 shall prepare, pursuant to the provisions of Recommendation 33, as amended, a plan for refinery operation in District 1 which shall assign levels of crude-oil runs in each refinery in such a manner that:

1. Required production of petroleum war products shall be maintained with a minimum of crude-oil runs in plants producing such war products in accordance with a monthly determination by the director of refining, Office of Petroleum Coordinator for War, specifying the petroleum war products the production of which are necessary at stated or maximum rates in District 1.

2. Crude-oil supplies currently available to refineries in the East Coast area shall be assigned to all refineries in this area in such a manner that each refinery will have available, insofar as consistent with Subsection 1510.7 (1) hereof, the same percentage of the total available current crude-oil supplies as the percentage which such refinery's crude-oil runs in the East Coast area is to the total crude-oil runs of all refineries in the East Coast area during the last 6 months of 1941.

The plan shall provide that all refineries in the East Coast area shall produce the maximum quantity of heavy fuel oil and a minimum quantity of motor gasoline insofar as consistent with Subsection 1510.7 (1) hereof.

East Texas Shipments Provided

§ 1510.8. *Crude oil from East Texas.*—In order to increase supplies of crude oil in the East Coast area so that total refinery runs of 400,000 bbl. per day may be maintained in East Coast refineries and to provide an outlet for East Texas crude oil so that supplies of isobutane required for petroleum war products may be maintained, arrangements shall be made as follows:

1. The refining committee for District 1 shall arrange for a movement by tank car of 100,000 bbl. per day of East Texas crude oil, in addition to that now being so moved, and prepare a monthly schedule of such movements showing specific points of loading.

2. The refining committee for District 1, in strict accordance with the provisions of § 1510.7 of this chapter, shall calculate and assign to each refiner in the East Coast area a proportionate share of the additional crude oil to be brought into the East Coast area from East Texas, and compile therefrom a monthly schedule showing specific destinations. Each refiner in the East Coast area shall purchase and bring into District 1 such proportionate share of such additional crude oil. The refining committee for District 1 shall furnish complete information as to such monthly schedules to the joint tank-car subcommittee for Districts 1, 2, and 3.

3. The joint tank-car subcommittee for Districts 1, 2, and 3 shall secure the necessary tank cars in accordance with the provisions of § 1510.3 of this chapter and arrange for the use of such tank cars in the service of moving crude oil pursuant to Subsection 1510.8 (1) hereof to destinations in the East Coast area named by the purchasers determined pursuant to Subsection 1510.8 (2) hereof.

§ 1510.9. *Gasoline: Lake tanker movement.*—In order to increase supplies of motor gasoline moving into District 1 by lake tanker by at least 10,000 bbl. per day in excess of present movements, arrangements shall be made as follows:

1. The supplies and distribution subcommittee for District 2 shall, subject to the direction of the director of supply of the Office of Petroleum Coordinator for War or of such district director as he may designate, arrange for purchases, sales, exchanges, and loans of motor gasoline among those engaged in the petroleum industry in District 2 so as to make sufficient supplies of motor gasoline of an appropriate quality available for shipment by lake tanker into the Buffalo, New York area of District 1 and shall notify the supplies and distribution subcommittee for District 1 of supplies available for such shipment.

OPC Instructions Now Called "Directives"

WASHINGTON, D. C.—The term "Petroleum Directive" has been added to the oil industry's wartime lexicon. It replaces "Formal Recommendation" in describing the orders of the Office of Petroleum Coordinator.

This easier and more accurate term appears for the first time on the fiftieth set of instructions issued by OPC. From the time the OPC was created nearly a year ago, the oil industry has been following its formal recommendations as though they were legally binding orders, and since Pearl Harbor they have been considered fully mandatory under the war powers of the executive.

2. The supplies and distribution subcommittee for District 1 shall notify all primary marketers of motor gasoline in the Buffalo area of the availability of such supplies.

§ 1510.10. *Gasoline: Supply sources of Southeast.*—In order to maintain supplies of motor gasoline for the states of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi (hereinafter referred to as the Southeastern area) and release tank cars for moving petroleum and petroleum products into the North Atlantic area, the following arrangements shall be made:

1. The supplies and distribution subcommittee for Districts 1 and 3 shall, subject to the direction of the director of supply of the Office of Petroleum Coordinator for War or such district director as he may designate, arrange for purchases, sales, exchanges, and loans of motor gasoline among those engaged in the petroleum industry in Districts 1 and 3 so that the entire supply of motor gasoline for consumption in the southeastern area shall be obtained through points of entry on the Mississippi River and the Gulf of Mexico.

2. The supplies and distribution subcommittee for Districts 1 and 3 shall devise a plan or plans pursuant to Recommendation 33, as amended, to accomplish the above objective. Such plan or plans shall include provisions for:

(*i*) The common use of river and Gulf bulk terminals by all primary suppliers of petroleum products in this area, regardless of ownership of such terminals.

(*ii*) Limitation on use of pipe lines for local distribution purposes to the end that the maximum use of such pipe lines shall be made to supply the most northerly and easterly portions of this area.

(*iii*) Limitation or elimination of the use of tank cars for local distribution of petroleum products within this area.

Florida Route Specified

§ 1510.11. *Plan for Florida movement.*—The supplies and distribution subcommittee for District 1 shall, pursuant to Recommendation 33, as amended, devise a plan for the movement of at least 100,000 bbl. per day of petroleum and petroleum products, by tanker or barge from the Gulf Coast area of Texas and Louisiana to ports on the West Coast of Florida, thence by tank car to points of distribution in District 1 or to storage at Norfolk, Va., for transshipment by tanker, barge, or other transportation methods to points of distribution in District 1. Such plan shall be submitted by such committee to the chief counsel of the Office of Petroleum Coordinator for War on or before May 15, 1942.

§ 1510.12. *Effectuating plans and schedules.*—The committees and subcommittees referred to in § 1510.3 to § 1510.11, inclusive, of this chapter, and all persons affected by any plan or schedule formulated in accordance with said sections shall, upon the approval of any such plan or schedule by the chief counsel of the Office of Petroleum Coordinator for War, carry into effect such plan or schedule according to its terms, conditions, and intent.

§ 1510.13. *Reports.*—Each committee or subcommittee affected by this directive shall file a weekly progress report with the chairman of the general committee for the appropriate district. A copy of all reports, schedules, or other documents prepared pursuant to the terms of this directive shall be forwarded to the appropriate director in the Office of Petroleum Coordinator for War.

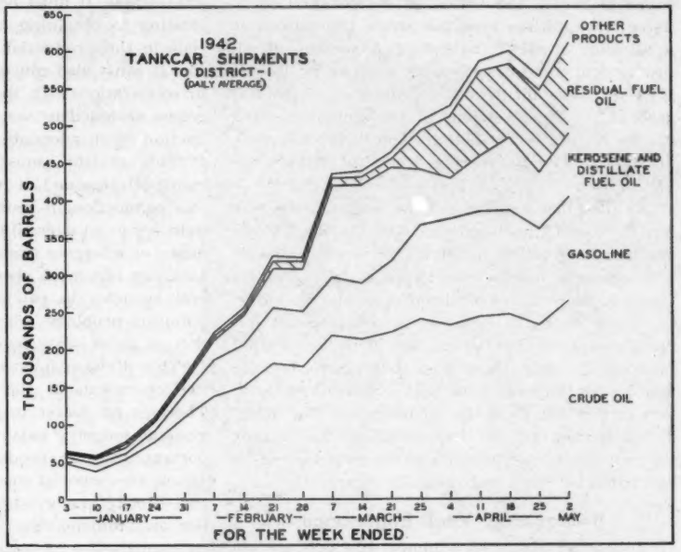
§ 1510.14. *Expenses.*—Any expenses incurred by any committee or subcommittee pursuant to the operation of this directive shall be defrayed by the appropriate general committee pursuant to the provisions of Recommendation 7.

Heavy Fuel-Oil Delivery Still Short of Demands

By J. P. O'DONNELL

NEW YORK.—In its attempt to meet the critical demand for heavy fuel oil in the northeastern area, the oil industry has stepped up shipments of this product by tank car in the last 3 weeks more than 130 per cent above the preceding 3 weeks but still is short of meeting requirements. In an attempt to meet the deficiency, efforts are being made to obtain an additional 14,000 tank cars to be used exclusively for the transportation of residual fuel oil.

This step probably will necessitate the withdrawal of cars from the transportation of other products and thus will result in the curtailment of shipments of gasoline, asphalt, etc. However, the need for residual fuel oil has given it preference over all other products and every effort will be made to meet demands of industries dependent on it. The use of cars not equipped with coils will require the use of greater quantities of higher-priced light fuel oil and thus will add further to the already tremendous cost the industry is bearing in supplying District 1 by rail.



Fuel oil dominates rise of tank-car oil movement

Loading of residual fuel oil in the week ended May 2 averaged 121,275 bbl. per day. In the last 3 weeks the average has been 110,500 bbl. per day against 47,600 bbl. in the preceding 3 weeks.

This graph also shows the remarkable progress made by the railroads and the oil industry in meeting this problem. An even better picture of this progress is shown by a comparison of tank-car shipments for the week ended January 10 with those of the week ended May 2 which follows:

(Data in barrels per day)

Product—	Jan. 10	May 2	Per cent gain
Crude oil	38,346	264,677	590
Gasoline	9,611	138,857	1,345
Kerosene, etc.	6,653	85,404	1,184
Residual	2,282	121,275	5,214
Others	1,832	30,265	1,552
Total	58,724	640,477	990

The effect of more costly transportation on the oil companies is not indicated in most first-quarter reports which cover the entire 3-month period as a unit. However, one, the Atlantic Refining Co., broke down its earnings by months, thus providing a picture of how the increasing volume of rail shipments is affecting it. This shows per share earnings, before taxes, of $1.02 for January, 27 cents for February and a loss of 47 cents for March.

"This deterioration in operating results was primarily due to increasing costs of transportation without compensating increases in prices of our products," the report states. "War-risk insurance on tankers, slower turnabout of ships and the relatively high cost of transportation by tank car added approximately $1 per barrel to the cost of delivering crude oil to our Point Breeze refinery. In addition, our refining costs increased substantially because, despite our use of all available means of transport, we were forced more and more to operate below refinery capacity."

The relative effect of this condition on the companies participating in the tank-car pool is shown in the following table of the approximate number of cars loaded by each company in the period covering the period from January 3 to April 25.

Company—	Cars loaded
American Mineral Spirits	519
Arkansas Fuel Oil Co.	261
Atlantic Refining Co.	15,638
James B. Berry Sons Co.	27
Cities Service Co.	6,920
Continental Oil Co.	1,300
Gulf Oil Corp.	14,413
Hartol Products Co.	546
Pan American P. & T.	14,170
Petrol Corp.	2,321
Petroleum Heat & Power Co.	264
Pure Oil Co.	2,051
Shell Oil Co.	11,475
Sinclair Refining Co.	12,219
Socony-Vacuum Oil Co.	20,557
Standard Oil Co. (Kentucky)	1,487
Standard Oil Co. (New Jersey)	41,691
Sun Oil Co.	9,316
Tide Water Associated Oil Co.	3,873
Texas Co.	19,421
Miscellaneous	77

The highly involved nature of rail transportation is apparent from the fact that at least two of the companies are loading crude oil and refined products at from 40 to 45 points. In addition a considerable portion of it is consigned directly to New England, where the greatest bottleneck is encountered. In the week ended April 25 there were 5,282 cars consigned to New England points representing about 30 per cent that week.

In the same week, 7,250 cars of crude oil were loaded for shipment into District 1. The length of the hauls involved in supplying East Coast refineries from Baltimore to the Boston area is apparent from the following list of states, showing the origin of the crude-oil shipments in that week: Illinois, 1,687 cars; Michigan, 290; Louisiana, 1,732; Mississippi, 1,192; Texas, 678; Ohio, 1,243; Oklahoma, 339; Indiana, 3; western New York, 86.

Full War Responsibility Given Natural Gas and Gasoline Men

NEW ORLEANS, La.—Functions incumbent on the natural-gas and natural-gasoline industries in the elevation to full division status in the organization of the Office of Petroleum Coordinator were outline here last week. Obligations as a division of OPC, instead of a section of oil production, were described in a paper by Robert E. Allen, assistant deputy coordinator, which was read at the final sessions of the annual meeting of the Natural Gas Section, American Gas Association. Extended excerpts from Mr. Allen's paper follow:

"As time has gone on and the tempo of the war has increased, the importance of the natural-gas and natural-gasoline industries to the nation's wartime economy has increased substantially. Despite the fact that your oil brethren represent an industry three times as large as the natural-gas and natural-gasoline industries, let it be recognized immediately that these industries have become and are as important to the successful prosecution of the war as is the oil industry. The recognition of this fact requires action on the part of the petroleum coordinator's office with respect to our administrative and internal organization.

Recognizing Vital Importance

"As the petroleum coordinator told you, we are meeting this situation and recognizing the vital importance of natural gas and natural gasoline to the war by establishing a Natural Gas and Natural Gasoline Division, which will function in the same manner and on the same level with the other operating divisions in our office. The Natural Gas and Natural Gasoline Division will occupy a position parallel to and on a par with the Production Division, the Refining Division, the Transportation Division and the Marketing Divison of the Petroleum Coordinator's Office.

"Let me briefly review the responsibilities which the Natural Gas and Natural Gasoline Division must assume. This division must concern itself with the problems involved in the production of natural gas. It must be ready to handle problems relating to obtaining and utilizing critical materials in the production and gathering of natural gas. It must also concern itself with formulating, in cooperation with the industry, plans and programs designed to assure the discovery and production of an adequate quantity of natural gas.

"This division must concern itself with the transportation and distribution of natural gas. In this connection, it must not only work with the industry in an over-all effort to assure the maintenance of adequate transportation and distribution facilities, but must also cooperate with other federal agencies in solving transportation and distribution problems which are within the jurisdiction of those other federal agencies.

"This division must concern itself with the entire operations of the natural-gasoline industry. There is no secret to the fact that the natural-gasoline industry today can and must play an important role in producing those hydrocarbons which are essential components of vital war products—100-octane aviation gasoline, synthetic rubber and toluene. This division must constantly concern itself with assuring that the natural-gasoline industry and related activities make the full measure of their contribution to this important phase of the war program. As respects natural gasoline and the important derivatives of natural gas, this division must play an over-all role. This division must concern itself with the construction and operation of natural-gasoline extraction plants. Beginning with the gas from which these hydrocarbons may be obtained, through the construction of plants and facilities for their extraction, along the various avenues of transportation, into the manifold and complicated distribution system, this division in close cooperation with the industries, must take the necessary steps and formulate the necessary plans to assure that on this front, at any rate, there shall be a constant, adequate supply of these vital components.

"I could spend much more time outlining the detailed functions of this new division, but I think the matters which I have mentioned here will give you an idea of the important job that this division faces. I have every confidence that this division will do a splendid piece of work. No small part of that confidence, gentlemen, is due to the fact that in recent months I have come to know many individuals in your industries quite well. My experience has taught me that they are men of action, and men who can and will, in this emergency, work closely with those of us in government.

Present Personnel To Be Retained

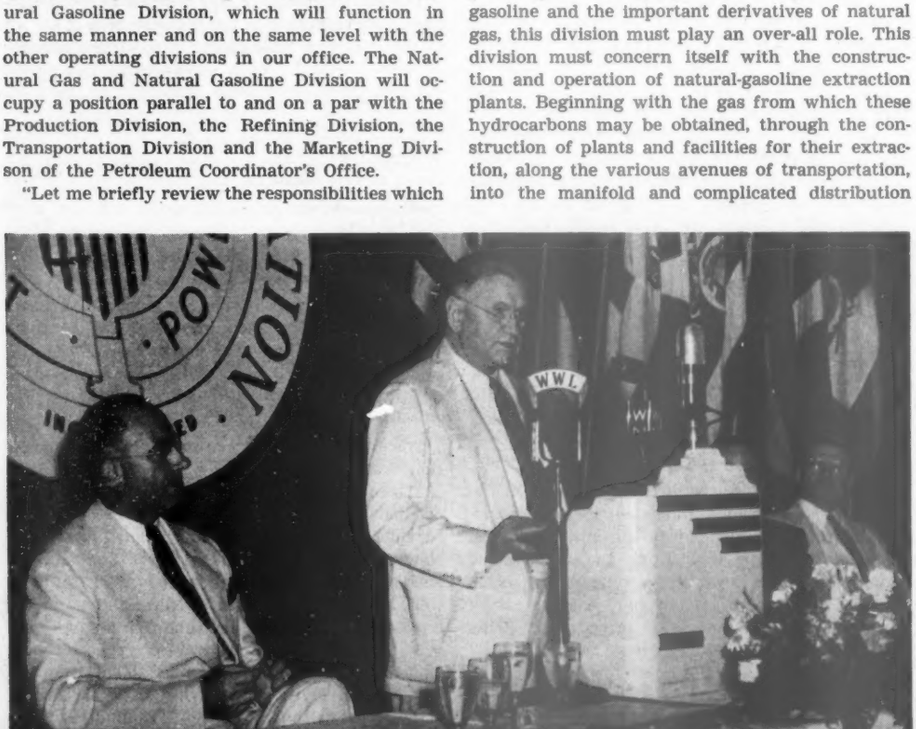
"The personnel of this new division has not yet been fully decided upon. However, this much I can assure you: Paul Raigorodsky, Tom Weymouth, Frank Brewster, Virgil Bowyer, Bob Drucker, Jimmie Pew, D. E. Buchanan, and others who are now with us will remain with us, in high and responsible positions. These men have done a splendid piece of work. You, in the industry, can be proud that they have served with us in this emergency. Not only have they been a credit to the ability and technique of the natural gas and natural-gasoline industries, but they have made a real and lasting contribution to the work which our office must do in the war program.

"In selecting the staff of the Natural Gas and Natural Gasoline Division, we have every intention of calling upon you in industry to provide us with competent and adequate personnel. We need these men, government needs them today to help us do a job that must be done. We need their brains, their energy and vision, so that government and industry together may, on this sector of the war front, guarantee that the war effort of this nation will have the required constant, adequate supply of natural gas, natural gasoline and derivatives, where needed, when needed, and in the amount needed. While I have put myself in the position of one who will ask for favors, I have every confidence that you will respond to our requests for personnel in identically the same splendid fashion you have responded to all of our other requests.

"The petroleum coordinator's office is fortunate in that it enjoys the most favorable of relations with other government agencies which have some real interest in the natural gas and natural-gasoline industries.

"In relation to the War Production Board, the petroleum coordinator's office occupies a unique position. In so far as the oil and gas industries' use of critical materials is concerned, we are an end-products branch, just as is the amtomotive branch of the War Production Board. And in so far as the products of petroleum, or the product of natural gas, or the product of natural gasoline are concerned, we are a commodities branch. As a result, the over-all responsibilities of the petro-

(Continued on Page 41)



J. French Robinson, chairman of the Natural Gas Section, A.G.A., and president of the East Ohio Gas Co., Cleveland, Ohio; Harold L. Ickes, petroleum coordinator; A. F. Bridge, general manager, Southern Counties Gas Co., Los Angeles; A. B. Patterson, New Orleans Public Service Co., New Orleans

Keystone Pipe Line Reversed And Made Into Crude Carrier

By J. P. O'DONNELL

NEW YORK, N. Y.—The first northeastern products pipe line to have its flow reversed and to be transformed into a crude-oil carrier is scheduled to go into operation as such about May 15 or 16. This is the 280-mile line of the Keystone Pipe Line Co., a subsidiary of the Atlantic Refining Co., which normally delivers products from Atlantic's Point Breeze, Pa., refinery to Pittsburgh and terminals en route. In its new capacity, the 8-in. line will transport about 20,000 bbl. of crude oil per day from Pittsburgh to Point Breeze.

Decision to reverse the flow of the line and transform it from a products to a crude-oil carrier was made February 13, when it was apparent that the greatest transportation problem in the history of the industry was rapidly developing. Delays incident to obtaining necessary priorities for materials and for the use of electric power prevented earlier conversion of the line which, it is believed, could have otherwise been accomplished in about a month. This fact is brought out not as criticism of the heavily burdened WPB but as an explanation of the 70-day period required for the conversion.

It was necessary to get priorities first for certain material for the new stations and for the electric-power supply required. The latter application was contingent upon the granting of the necessary priority for the pipe-line materials. These priorities were applied for on March 10 as soon as the necessary engineering work had been completed. They were granted April 16. The application for the power requirements was approved May 7 and power lines are now being strung to the new Pittsburgh station. It is expected that this step will be completed and that the line will be in operation about May 15 or 16.

Meanwhile, instead of waiting for the completed transformation of the line, the company has been shipping gasoline eastward from Pittsburgh. This was accomplished by the installation of small portable pumping equipment at the western terminus of the line. An average of almost 4,000 bbl. of gasoline, brought up the Mississippi and Ohio rivers by barge from Gulf Coast refineries, has been sent eastward daily for the past 2 months.

In addition, the necessary unloading racks and tankage have been installed at Pittsburgh. An average of 35,000 bbl. of crude oil per day is now being delivered by tank car to the Point Breeze refinery. When the line conversion is completed 20,000 bbl. of this amount will be pumped through it. This is expected to reduce the average turn-around time for the tank cars from the approximately 15 days required in the Southwest-Philadelphia service to 13 days. This will be a saving of 13 per cent in time and will have the effect of releasing about 200 tank cars.

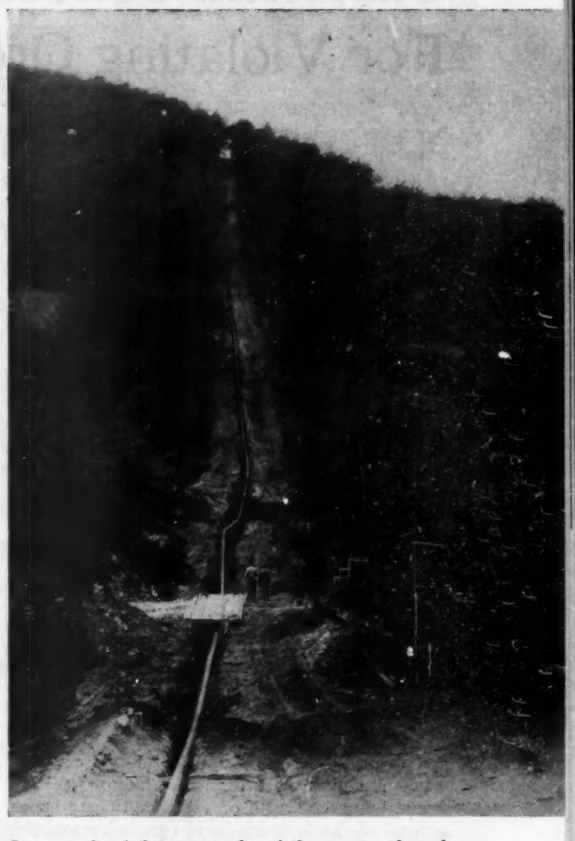
In order to use the line for the eastward shipment of crude oil the erection of two new stations and the revamping of four existing stations was required. One of the new stations was installed at Pittsburgh, and the second, known as the Vinco station, near Johnstown, Pa. Wherever possible, equipment was transferred from other stations to avoid delays that would be encountered in obtaining new equipment. Equipment for the new Pittsburgh unit was brought from the Blue Mountain station on the western leg of the Keystone line. Equipment for the Vinco station, just west of the main Allegheny Mountain ridge, was transferred from the Altoona station, east of this ridge.

Two former stations were reestablished and two existing ones reversed. The reestablished stations are at Mount Union, into which equipment was moved from the Big Flats, N. Y., station of the northern leg, and at Mechanicsburg, where equipment was also moved in from another station. Those reversed are located at Loyalhanna and at Montebello. The latter included additional pumps which were brought in from the Point Breeze station. The reversal of stations necessitated changes in the manifold system and putting the intake on the reverse side. This job was completed 3 weeks after the decision to change the line was made with the exception of incidental new equipment and the installation of the power lines.

Stations Equipped With Centrifugal Pumps

All the stations are equipped with centrifugal pumps operated by 600-hp. electric motors. Those on the western end of the line were equipped to pump the crude oil over the Allegheny Mountains. Elevation of the highest point on the line is approximately 2,400 ft., while the elevation of the Pittsburgh station is approximately 600 ft., a rise of 1,800 ft.

The eastward capacity of the line as a crude-oil carrier will be 20,000 bbl. in contrast to its westward capacity as a refined-products line of 25,000 bbl. The line was built in 1931 and extended in 1935 and was one of the country's first major products lines. When this emergency is passed, the company will face an entirely new problem. In addition to again reversing the direction of flow it will have to clean out the crude oil in order to prevent contamination.



An example of the topography of the country through which the reversed Pittsburgh branch of the Keystone Pipe Line Co.'s line passes

The company intends to continue to operate the parallel 114-mile line from Point Breeze to Mechanicsburg. It is planned to use this line to supply the northern branch to an extent dependent on the restricted ability of the refinery to operate. Continued use of this line will eliminate the need for other transportation means to serve the area which it now serves. Consideration has been given to the possibility of converting the Buffalo line but in view of the difficulty of getting supplies to that point it has not yet been possible to develop this conversion.

REGIONAL SURVEYS

Beginning on Page 100 is a survey of developments in Illinois during 1942, together with a list of the producing fields and pay horizons.

This is the first of a series which is planned to cover the entire United States each year. The information presented in these regional surveys is intended to supplement that given in the annual and semiannual numbers in order that Journal readers may have available complete and up-to-date records of the production, reserves and development of all fields in the United States.

Amsco Pipe Line Co. Stops Runs From Six Fields

HOUSTON, Tex.—Amsco Pipe Line Co., which gathers and purchases crude in several Southwest Texas fields, has discontinued operations in all pools producing low-octane grades of oil. Amsco is continuing runs from the Plymouth field, San Patricio County, where the volume handled is approximately 8,000 bbl. per day. Fields from which runs have been discontinued include Luby, Taft, East White Point, Saxet, Adami and Munson.

STATE CAPITALS...

California Concern Penalized For Violating Order M-68

LOS ANGELES, Calif.—The War Production Board last week took first punative action against a California oil operating company for alleged violation of Conservation Order M-68. No further warnings will be given, officials declare, and from now on producers must conform to the letter of the restrictive regulations.

Bel-Air Oil Co. is the first to suffer punative action of the WPB. The company has been denied use of priority ratings for a period of 3 months and is prohibited from producing its 2 Twitchell, a completed well in the Santa Maria Valley field of Santa Barbara County, for a like period. The well was spudded after the December 23 deadline and subsequently completed in alleged violation of spacing regulations. There have been a number of other violations with respect to the deadline but in most cases the wells in question have been shut in and are therefore not subject to penalty except for the loss of production.

Any oil that is illegally produced in violation of the conservation order, cannot be moved, refined or purchased, according to subsequent rulings. No refiner would jeopardize his standing by processing the "hot" oil and no legitimate trucking or pipe-line company would handle it.

The production committee for District 5 has a list of several operators who may soon suffer penalties if present practices are continued. If they have any overages for the month they will be placed on the so-called blacklist and will be prohibited from producing as well as losing all rights under the priority rating system.

ARKANSAS

MEMBERS OF THE Oil and Gas Commission are discussing phases of the Office of Petroleum Coordinator's order lowering refinery operations with federal officials. Commission members have indicated that the order would be examined in all its aspects.

A reduction of 17 per cent in the production of crude oil and condensate in the State of Arkansas would be necessary to prevent addition to aboveground stocks if the federal recommendation of refinery runs is adhered to.

Along with other refineries, those of Arkansas were requested by the petroleum coordinator to reduce, during the month of May, runs to stills to 70.5 per cent of the daily average for the last 6 months of 1941. The average daily run during that period, according to sworn reports in the office of the Oil and Gas Commission, was 36,837 bbl. The percentage reduction recommended by the federal coordinator would leave allowed runs at 25,970 bbl. daily.

During March the refineries ran 38,005 bbl. to stills as a daily average. To reduce that figure to 25,970 bbl., the federal rate, would be to reduce refinery runs by 31.7 per cent.

Just where a reduction of 12,035 bbl. daily can be made in production is not known, although Arkansas' conservation law prohibits the unnecessary storing of oil aboveground. Approximately 8 million barrels of empty storage space is now available in the state, having been emptied over the past few years as a conservation measure.

Crude-oil and condensate production in May, as fixed by the Oil and Gas Commission, is 70,748 bbl. daily. To follow through the reduction recommended at the refineries of 12,035 bbl. would leave only 58,713 bbl. daily, a minimum figure for a good many years.

Arkansas is one of the oil states of relatively low production, ranking eighth among the 23 states. About 50 per cent of the state's production is currently being exported eastward, the balance being refined and used to satisfy a ready trade-area market.

TEXAS

THE RAILROAD COMMISSION Tuesday issued a proration order for the last half of May authorizing production of 1,400,000 bbl. daily, a rate endorsed by Jerry Sadler and Olin Culberson, two members of the three-man body. Chairman Ernest O. Thompson was not in Austin and his signature to the order was missing.

The figure of 1,400,000 bbl. daily was fixed by the commission on the basis of "firm" nominations submitted by purchasers of crude. It is 440,000 bbl. per day higher than recommended by the Office of Petroleum Coordinator.

REMOTENESS OF TEXAS from the large eastern consuming centers this week drew from E. L. DeGolyer, director of conservation, Office of Petroleum Coordinator, the conclusion that the 24-in. line linking the two areas offers the only permanent solution to the petroleum transportation problem. Mr. DeGolyer spoke at the hearing of the Railroad Commission May 11 in Austin at the request of J. R. Parten, ORC director of transportation.

"I am here to review the oil transportation situation which has undergone violent displacement," Mr. DeGolyer declared. "The OPC knows Texas is suffering and believes the ultimate solution is a pipe-line job.

"Currently there are only 800,000 bbl. of oil daily reaching the East Coast. That means we are short 520,000 bbl. Of course, Texas cannot produce the oil if it cannot be transported.

"Railroad tank cars, which provide temporary but material aid, now are transporting 640,000 bbl. daily. Barges, whose efficiency declines because of their lack of speed, are furnishing 73,000 bbl. daily." The hearing was called by the commission to obtain a check on the crude requirements of purchasers for remainder of May. Temporary proration schedules have prevailed in Texas during the first half of this month, allowing producers approximately the same rate of production as prevailed in April. For May, Petroleum Coordinator Ickes recommended a reduction in Texas production to approximately 960,000 bbl. daily, compared to base allowable of 1,070,000 bbl. in April.

Before Mr. DeGolyer discussed efforts of the OPC to solve transportation problems, which developed because of tanker losses, Chairman Ernest O. Thompson of the commission expressed the opinion federal loans to operators would keep them out of bankruptcy.

"Pending solution of the transport problem by pipe lines and barges using the intercoastal canal," Mr. Thompson asserted, "the federal Government may have to purchase and store crude and gasoline in order to keep the small operator and refiner from being forced out of the picture.

"The storage facilities are available and the oil can be gotten to storage. By this method, the operator can pay his bank loans and keep up his search for oil. We had better keep him alive. He finds the oil."

Mr. Thompson read 1937 figures showing that at that time 87.9 per cent of oil produced in the Southwest moved to market by water routes and the remainder by pipe lines, railroads and trucks.

After Mr. DeGolyer concluded his report, the commission launched into a tedious process of checking, field by field, the needs of purchasers for the remainder of May.

During the opening minutes of checking, the Humble Oil & Refining Co. indicated its original nominations remained firm but Magnolia Petroleum Co. reported it would not need as much oil as it had indicated a month ago.

KANSAS

JEFF A. ROBERTSON, Kansas City, Kans., has been appointed chairman of the Kansas Corporation Commission succeeding Andrew F. Schoeppel, Ness City, who has opened his campaign for the Republican nomination for governor.

Mr. Robertson has served as state labor commissioner since July 1, 1939, and prior to that time he was chief probation officer of the U. S. District Court. Recently, he was offered the position as state director of the Office of Price Administration but elected to accept the state job.

In addition to functions as a member of the Corporation Commission, Mr. Schoeppel has been the Kansas representative on the Interstate Oil Compact Commission. Gov. Payne Ratner has not yet designated a successor to Mr. Schoeppel on the Compact Commission.

ALLOWABLE PRODUCTION of natural gas from the Otis field in Rush and Barton counties for May was established last week at 495,858,000 cu. ft. daily.

Allowable for the Cunningham field in Kingman and Pratt counties was fixed by the Corporation Commission at 775,000,000 cu. ft.

THE CORPORATION COMMISSION will hold its regular monthly proration hearing upon which to base June allowable at Wichita May 21. At the same time, the commission will consider allowable gas production from the Otis and Cunningham fields for June, July and August.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Salute the New Division

The formation of a natural-gas and natural-gasoline unit by OPC to operate on an equality with the divisions already established is a deserved recognition of those two allied activities.

Everyone who followed the proceedings of the annual sessions of the Natural Gas Section of the American Gas Association last week at New Orleans, and those of the Natural Gasoline Association of America this week in Tulsa, was impressed with the contribution of products and services which these two enterprises are already making in the war plans.

Consideration of what they are doing in research and in the development of new processes is equally convincing and reassuring as to what may be expected for the future in products which will be needed during the emergency and later.

Natural gasoline in the past has not been given the recognition it deserved, possibly because it started as a minor-product operation and the petroleum industry generally has not realized that it has grown up.

The present natural-gasoline production of 240,000 bbl. daily, coming from more than 600 plants in 16 states, is not far from equaling the Axis output of petroleum, including those oils synthetically produced. It exceeds the 1918 consumption of all motor fuels in this country.

Cycling and repressuring have added to the output of natural gasoline and its derivatives and have strengthened the already outstanding conservation position of manufacturers. More will be heard of these newer developments with the return to normalcy.

Natural gasoline's position, however, is based not so much on quantity as the characteristics of the hydrocarbons which come from its plants. It made volatility available to the engine designer at a time when it was needed, and it has aided in the trend toward higher antiknock motor fuels.

In addition, the lighter hydrocarbons, largely a waste product for many years, have become the basis for a liquefied-gas industry which has brought the convenience of gas fuel to tens of thousands of homes and hundreds of manufacturing plants.

Now the natural-gasoline manufacturer, through the synthesis of his products, is moving rapidly into new fields of greater importance to his industry in many respects than anything that has been done before. Collectively, these manufacturers can now furnish larger quantities of certain hydrocarbons which can be used in the manufacture of 100-octane, synthetic rubber, and other critical products than are presently available from any other sources. The manufacturing arts are known—all that is needed is the support of those who are directing the Government's programs.

The natural-gas industry has also made a start along similar lines in the utilization of its hydrocarbons as a basis for new chemical operations which need to be encouraged at this time because of their assured contributions to the war effort.

Natural gas, as it has been known for more than three-quarters of a century, was ready when the emergency programs were promulgated and it became a part of hundreds of plans almost overnight. Many essential industries started with their gas-fuel problem solved before production plans were under way. The armed forces will be best fed of all time because of the nutrition services of the gas industry.

There are many things that remain to be done before full use will be made of natural gas and natural gasoline. Working together, under OPC, producers and manufacturers will constitute an important segment of the industrial front line which will shortly enable the military of the United Nations to take the offensive away from their enemies.

Industry Endorses Elevation of Ickes to Position With WPB

Two weeks ago the Journal recommended placing Petroleum Coordinator Ickes on the WPB, and giving oil a greater voice in the nation's war economy program. This editorial has elicited numerous letters from readers who believe with our editors, and who make additional recommendations. Some of these letters were published last week, and others which are representative of the industry's comments are presented on these pages.

Three-Point Program Would Increase Industry's Efficiency

By A. L. WEIL*

MR. ICKES, of course, should be made a member of this board, but that is not enough. He and his organization have done a fine job in the Office of Petroleum Coordinator. Whatever lack of accomplishment has occurred has been due to the lack of concentration of authority. In my judgment, in order to make the oil industry operate with thorough efficiency and without the delays which have accompanied the implementing of sound recommendations of the Office of Petroleum Coordinator, it is necessary that three steps be taken:

1. A statute should be passed providing, in effect, that when any government official (including the petroleum coordinator) who is charged with the duty of hastening the war effort, finds it necessary to recommend that the members of any industry cooperate in a manner that may violate the antitrust laws, compliance with such recommendation should exempt the members of the industry from the pains and penalties of such laws. The approvals now being obtained from the Attorney General's Office are entirely inadequate for that purpose.

2. The only way the OPC can secure compliance with certain of its recommendations is through the means of priorities over which the OPC has no control. To remedy this the WPB should allot an over-all tonnage of steels, and other strategic materials, to the oil industry, whereupon the distribution thereof among the members of the industry and the purposes for which it should be used should be committed to the OPC. The present method of having one organization recommend a course of procedure and having it depend on another organization to implement that procedure is conducive to wholly unnecessary delays and unintelligent decisions.

3. When the OPC finds it necessary to ask the oil industry to incur additional costs in operations, for example—shipping products by rail into District 1 or into the Northwest, or to increase the production of marginal wells that are not paying the cost of production—and represents that it will endeavor to permit the charging of higher prices to meet these additional costs, the OPC should not be dependent on the price administration to carry out its commitments when the oil people have complied in good faith with these requests but should have authority over prices where such authority is necessary to carry out its program.

*Mr. Weil recently resigned as chairman of District 5 of OPC to resume private law practice.

Only Shortcoming Has Been Lack Of Sufficient Authority

By M. L. BENEDUM
Independent Operator

I HAVE read this editorial with a great deal of interest and approval. It seems to me that in clear and forceful language you have expressed the sentiment of the oil industry and of a very large proportion of our citizenship not connected with the industry.

Mr. Ickes has done a magnificent job as petroleum coordinator. In that position he has rendered a distinct and outstanding service not only to the industry but to the country and his efforts are appreciated by every right-thinking American. He has displayed a broad grasp of the problems of the industry and under his intelligent and forceful leadership the oil industry has been brought into a happier and more cooperative relationship with the Government than perhaps any other economic group in the country. I do not think there is an oil man in the country that does not have full confidence in Mr. Ickes and he has demonstrated upon many occasions that this feeling of confidence and respect is wholly reciprocated.

The one thing about Mr. Ickes' work as petroleum coordinator that has been distressing to me—and I am sure that it has likewise been distressing to many others in the oil business—is that he has not been given the power to translate his policies into effective action. Although he is charged with full responsibility for coordinating all activities of the oil industry, including production, processing, transportation, and marketing, he has no control whatsoever over priorities, price controls, or distribution. These powers are vested in other agencies of the Government, principally in the War Production Board. It seems obvious that as a member of that board he would rightfully be in a position more effectively to translate his comprehensive grasp of the industry's problems into a realistic program of action that would be beneficial to the nation.

In my opinion it has been a happy circumstance for the industry and the country that Mr. Ickes was selected by the president as petroleum coordinator. His elevation to membership on the War Production Board would be a logical step. I sincerely hope that the president will see fit to make this appointment.

Best Posted Oil Authority Should Be Elevated

By FRANK PHILLIPS
Chairman of the Board, Phillips Petroleum Co.

I THINK by all means Mr. Ickes should become a member of the War Production Board, in consideration of his interest and effort in helping to win the war. He is the best posted man in Washington regarding the industry and I think he would be invaluable to the board.

Step Not Only Desirable But Quite Necessary

By E. E. PYLES
Chairman, Production Committee, District 5, OPC

AS chairman of the Production Committee for District 5 and one who goes to Washington to attend the monthly meetings of the Petroleum Industry War Council, I think your editorial is timely and one that should be given serious consideration by those having the authority to appoint Mr. Ickes to the War Production Board. As a member of this board, I am sure he would be in a better position to serve the oil industry of this nation as the Petroleum Coordinator for War.

Because of the importance of our industry, and the part we are to play in an all-out war effort, I think such an appointment is not only desirous but is quite necessary.

WPB Needs Experience and Information of Coordinator

By FRANK BUTTRAM
President, Independent Petroleum Association of America

SINCE petroleum products are the absolute essentials in our wartime effort there should be some one on the War Production Board conversant with problems of the petroleum industry and authorized to act effectively in coordinating the activities of this industry with the war effort. The one person qualified to do this is the Petroleum Coordinator for War, Harold L. Ickes. Mr. Ickes' success in coordinating activities of the petroleum industry suggests an equal degree of activity in bringing to the war effort the integrated service of the petroleum industry.

The petroleum industry today is facing more problems than it has ever known in any previous period. Transportation difficulties, readjustment of refinery activities, cuts in production, price inequities, legislative problems, loss of civilian markets: these are but the headlines in the long list of problems which the industry is called upon to solve. All of these are related to the war effort. All of these are familiar to Mr. Ickes. He is aiding the industry in the attempt to solve these problems quickly. He can bring to the War Production Board 10 years of intimate familiarity and experience with the work of the petroleum industry.

Mr. Ickes has manifold duties and responsibilities. He probably does not covet additional tasks. Nevertheless, the War Production Board needs a man with Mr. Ickes' experience and information. Even at the cost of overburdening a public official who already is carrying an extra heavy load, the petroleum coordinator should be added to the War Production Board in order to fill a vacant place in that agency's thinking, planning, and working for victory. The solution of many of the problems of the industry would be hastened and simplified if this could be done.

Logical Man to Deal With Oil On Larger Control Board

By EDWARD G. SEUBERT
President, Standard Oil Co. (Indiana)

NO products are more essential to successful prosecution of the war than those manufactured by the petroleum industry. Logically, production and use of petroleum commodities should be closely coordinated with all other forms of industrial production under the control of the War Production Board. For this reason I agree with your feeling as expressed in your editorial in the issue of April 30 that the petroleum industry should be represented on the WPB. Mr. Ickes is the ranking member of the administration directly concerned with coordinating the affairs of the petroleum industry with the war effort and logically the man to deal with petroleum on the larger control board if the responsibility cannot be given to some executive in the industry itself.

Mr. Ickes has shown such understanding of the industry's problems and such willingness to work with those who are most familiar with its problems and business that I believe he would be acceptable to the great majority as a representative of the industry on WPB.

The petroleum industry is of course going through a revolutionary reorganization in order to deal with the special conditions created by the World War. There is danger of disastrous results from such drastic measures as are being taken if all in authority who are dealing with the reorganization are not kept fully alive to the realities. The oil industry does desire more consideration in the broad handling of the nation's production program.

Appointment Would Serve Best Interests of Oil's War Effort

By W. S. HALLANAN
President, Plymouth Oil Co.

I APPROVE most emphatically the sentiment expressed in your editorial in The Oil and Gas Journal under the caption "Promote Mr. Ickes."

We can only win this war through the mobilization of oil production and distribution of petroleum products. It is idle talk about building hundreds of thousands of planes, of tanks of all sizes and kinds, and of ships to sail the seas, unless we know they can be given adequate motive power. This can only be assured through the oil industry of America.

The president should recognize this urgent war problem and place Mr. Ickes in a position of responsibility on the War Production Board. He has used the foundation of his experience as oil administrator in the NRA days of 1933 to form an intelligent and cooperative working arrangement between the Government and the oil industry. He has kept himself informed of the most minute detail of the many intricate problems that have faced the oil industry as a result of the dislocations of our whole transportation system. He would be an invaluable voice in the councils of the War Production Board — and it would be known that the decisions reached by this board had been made with full and complete information with respect to the complicated subject of oil production and distribution.

You have started a very commendable movement and I want to congratulate you. May I call your attention to the remarks I made before the A.P.I. Division of Production meeting at Pittsburgh on April 9 last, as follows: "The petroleum coordinator's office has been handicapped seriously because the legal power to carry into effect its policies has been mainly lodged in other war boards and this has been responsible for delays, confusion and lack of understanding that has brought serious aggravations. It is unfortunate that the full authority to deal with the problems of the oil industry, which arise during the quick-changing action of war, are not fully concentrated in the agency of government which is charged with the responsibility of dealing directly with these matters. Our war mobilization would have progressed farther and more satisfactorily if this had been possible."

I am convinced that the best interests of our war effort would be substantially furthered by the appointment of Mr. Ickes to membership on the War Production Board.

In Hearty Agreement With Idea

CLAUDE V. BARROW
Oil Editor, Daily Oklahoman

IN view of the severe criticism and hostility on the part of many persons within the oil industry upon the appointment of Secretary Harold L. Ickes as petroleum coordinator for national defense late last May, your commendation of his program and your suggestion that he be made a member of the War Production Board should enhance the Journal's rating as "the voice of the industry."

I heartily agree with the sentiment and suggestion made in your editorial of April 30, and compliment you in taking the initiative to give credit to a public official who has labored in the interest of the industry and its personnel.

OTHER VIEWS: The views of T. H. Barton, president of Lion Oil Refining Co. and C. L. Henderson, president of Western Petroleum Refiners Association, were published in the May 7 issue of the Journal, Page 112.

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Full War Responsibility Given Natural Gas and Gasoline Men

(Continued from Page 36)

leum coordinator's office are substantial, and the individual responsibilities of the particular operating divisions within the petroleum coordinator's office are material. This dual position, of necessity, means that the petroleum coordinator's office must work very closely, not only with the War Production Board, but with the Army and Navy Munitions Board, the Board of Economic Warfare, the Lend-Lease Administration, and other war agencies. We have now, and we shall continue to enjoy, a close working arrangement with these agencies. The Natural Gas and Natural Gasoline Division will, like the other operating divisions of our office, play an important part in these relationships.

"I have attempted to outline the administrative and organizational framework within which I hope we shall continue to function. I hope that these arrangements meet with your approval. Let me assure you that we are always receptive to suggestions of improvement. Up to now you have had full freedom to make any and all suggestions which you have wished to make. I want you to feel free to continue to make these suggestions. Let them come directly or through your industry committees. At all times they are welcome. If, in the past, all of your suggestions have not been adopted, you will realize, I am sure, that an agency such as the petroleum coordinator's office must carefully weigh and consider all suggestions against the over-all policies which it must adopt and administer. But your suggestions on organization, on objective, on method, are always received with serious consideration."

Standard of New Jersey Gives Review of War Contributions

NEW YORK.—Contributions of Standard Oil Co. (New Jersey) to the war program, covering manufacture of practically every critical derivative of petroleum and numerous corporate and personnel assistances, are outlined in the current issue of the Lamp, the company's publication.

The following excerpts review company functions that Government authorities have cleared for publication as being in the public interest.

"If plant materials can be provided without interfering with the war effort, rubber in quantities not only for military use but sufficient to keep the country's 30,000,000 cars on the highway is attainable as a direct result of Jersey's efforts. Buna-S capacity to meet these demands could be built at a cost of about $15 a car. This type of rubber was perfected as a result of the prewar Jersey-I.G. Farbenindustrie agreement.

"Butyl rubber, a 100 per cent Jersey discovery, is cheaper and easier to produce but up to the present not as good as Buna-S for tire purposes. Butyl tires have proved serviceable up to 10,000 miles' wear at speeds not exceeding 35 or 40 miles an hour.

"The United States and its Allies control the output of 100-octane gasoline. No enemy plane captured since the war began has carried anything to equal this. The winning edge in power and maneuverability which superfuel gives Allied fighters has been proved in the clouds.

"The fact that American aircraft-engine designers were years ahead of the world in devising power plants to take advantage of 100 octane is due in large measure to processes acquired by this company from the I.G. and perfected in the Esso Laboratories. Jersey was the first to arrange with the Government for expansion of 100-octane manufacturing facilities.

"The company also developed a new catalytic process which will have an important bearing on 100-octane production. These methods will produce a large proportion of the country's supply of raw materials for Buna-S and butyl synthetic rubber, 100-octane fuel and toluene for TNT.

The Stuff That Makes Bombs

"Whatever the merits of secret formulas, the most widely used explosive is the deadly trinitrotoluene, or TNT.

"Today, three out of every five United States bombs dropped on the enemy contain TNT made possible by Jersey's development of synthetic toluene. One plant, built and operated by a Jersey affiliate, is making synthetically from petroleum as much toluene as the entire coke industry. The original method used is based on a process which was acquired by Jersey through its agreement with the I.G. Farbenindustrie.

"In conjunction with the Maritime Commission and the Navy Department we built 12 large, high-speed oil carriers equipped for naval service at a cost to the company of $27,000,000. The Government added $80,000 per ship for increased speed and special defense features. When the Navy asked for them they were ready for action and were turned over to the Government under the terms of a previous agreement.

"At the outbreak of the war Jersey took the following steps to help meet Great Britain's suddenly expanded tonnage needs:

"(*a*) Arranged with one of its affiliates to assign several British flag vessels operating in the Far East to Allied service, replacing them with Norwegian time chartered ships.

"(*b*) Sold a number of its large Panama tankers to the Anglo-American Oil Co., Jersey's British subsidiary, and arranged with its Canadian affiliate to assign other large vessels to carry supplies to England and France, replacing these with tonnage released by Jersey.

"(*c*) With the permission of the U. S. Government, transferred many of its older American flag ships to Panama, thus making them available to carry oil into the British war zone.

"(*d*) In July 1941 turned over to the U. S. Maritime Commission at its request many Panama tankers for belligerent trade, before repeal of the Neutrality Act made it possible for American flag ships to carry supplies into the war zone.

"The tanker building program of the Maritime Commission now totals more than 250 ships. In August 1941 the company's marine department undertook at the commission's request supervision of all construction orders placed with a particular shipyard. To date these have totaled nearly 100 tankers.

"Since the outbreak of the war Jersey has undertaken to build as many tankers as the yards are able to contract for and has reconditioned 26 vessels.

Technology Aimed at War

"The Standard Oil Development has the largest group of petroleum technologists in the world. The extent of its contribution to the country's war effort may be judged from the fact that today 85 per cent of its activities are directly connected with the war program. One-fifth of the Esso Laboratories' work is under contract to the Army, Navy, National Defense Research Committee or the Office of Scientific Research and Development.

"Ninety per cent of the Gilbert & Barker Manufacturing Co.'s plant at Springfield, Mass., which formerly made oil burners, tanks and pumps, has been converted to war work.

Gilbarco assembly lines have been adapted to make munitions. Employment at the plant is up 50 per cent.

"Eighty-five per cent of all fuel oil consumed by the U. S. Navy in Atlantic coastal and Caribbean waters today is supplied by Jersey affiliates.

"Normally 95 per cent of the petroleum requirements on the Atlantic seaboard are brought here by ocean tanker.

"Here is what Standard has been doing to throw an emergency bridge between the country's oil-producing fields and its principal consuming center.

"1. Last year Jersey built a 236-mile pipe line from Portland, Me., to Montreal, Canada, at a cost of $8,500,000. The line has a rated capacity of 60,000 bbl. of crude a day, and cuts off the long 12-day tanker trip around the Gaspe Peninsula and down the St. Lawrence.

"2. With the Shell Union Oil Corp. and Standard Oil Co. (Kentucky), we completed in February the 1,261-mile $20,000,000 Plantation pipe line to carry refined products from Louisiana to Greensboro, N. C. The builders now propose to extend the line to Norfolk, Va., and boost its rated capacity from 60,000 to 90,000 bbl. a day by adding new pumping units.

"3. From a negligible quantity a year ago, Jersey is now taking more than 100,000 bbl. a day of crude at its East Coast terminals through tank-car deliveries. The company spent $161,000 to enlarge its tank-car loading racks at the refineries.

4. During the first 5 months of 1941, Jersey's movement of crude to the East Coast by pipe line averaged only 4,400 bbl. a day, all of it from nearby Illinois. Today the company is bringing in more than 20,000 bbl. a day through these underground carriers from faraway Texas and Louisiana.

"5. Unable to obtain steel priorities for new lines, Standard and other units of the industry are studying the possibility of digging up and relocating some 1,400 miles of old lines and reversing the direction of other carriers now moving oil westward.

"6. Inland barge movements by Jersey subsidiaries were 1,344,000,000 bbl.-miles in 1940. On the basis of schedules for the first 6 months of 1942, Standard's barge transportation this year should reach 4,344,000,000 bbl.-miles.

"Standard representatives helped plan the bombing of their own refineries in countries overrun by the Axis in 1939. Maps and aerial photographs of plants of Jersey's subsidiaries in Germany, Norway, France and Belgium were turned over to the Allied Nations.

Helped Destroy Properties

"Stocks and tankage at our two refineries located in occupied countries were destroyed in accordance with a prearranged plan, the destruction being done by the refinery personnel assisted by military engineers.

"The most complete destruction of company property was carried out in the Netherlands East Indies. Plans for the demolition of the N.K.P.M. refinery at Palembang were worked out by the company in cooperation with Netherlands Army engineers and the actual destruction carried out by a special military demolition squad after the Japanese had landed on Sumatra. At the same time wells were plugged with cement and pipe lines blown up.

"Although foreign subsidiaries are of necessity organized and operated under the laws of the countries in which they are located, Standard Oil Co. (New Jersey) is an American corporation. As a private enterprise it cannot assume the responsibility of decisions which might involve the foreign relations of the United States. These are the functions of the State Department and the company has cooperated to the fullest extent with that department.

"In the case of German and Italian airlines in Brazil the president of Standard Oil Co. of Brazil worked in close cooperation with the American Embassy at Rio de Janeiro. Deliveries to the Axis lines were carefully controlled until stopped at the direction of the United States ambassador last December.

"In negotiations between the Japanese economic mission and representatives of the Netherlands East Indies Government in 1940 and 1941 Standard Vacuum Oil Co. officials worked closely with the United States, British and Netherlands governments."

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WPB Modification of M-68 May Be Asked by OPC

WASHINGTON, D. C. — Rep. Raymond S. McKeough of Illinois said here last week he had learned that the Office of Petroleum Coordinator would soon recommend that WPB order M-68 be amended to permit drilling of one well to 5 acres for all depths up to 500 ft., one well to 10 acres for depths 500-1,500 ft., one well to 20 acres for depths 1,500-2,500 ft., and retain one well to 40 acres, except for individual exceptions on their merits, for all depths of 2,500 ft. or more.

Henderson's Price Policies in Conflict With Declared Intent

WASHINGTON, D. C.—The Office of Price Administration is determined to hold prices at the March ceilings, but it has no intention of holding a price schedule which puts people out of business.

These seemingly conflicting statements were made here last week by Price Administrator Leon Henderson before the House petroleum subcommittee. Called to explain the gasoline rationing system which goes into effect this week, Mr. Henderson was questioned by several committee members about his plans and policies for enabling the oil industry to recover its increased costs of transportation overland as a substitute for lost tanker shipping.

Asked several times about the possibility of a subsidy to the oil industry in lieu of increased prices, Mr. Henderson stated that there is no general policy for making up the past losses of an industry by subsidies, but he admitted that the Government is subsidizing certain sugar transactions and part of the increased cost of shipping coal to New England. He refused to be put in the position of approving subsidies as a general thing, describing them as a last ditch resort, and he agreed with Representative Lea of California that government subsidies are wrong in principle and cause multiple administrative difficulties.

The price administrator told the committee that the petroleum price unit of OPA makes a continuing study of oil prices and costs, that three upward adjustments in oil prices have been made on the basis of data furnished by the companies, and that further adjustments will be made if found necessary. Asked flatly if OPA would permit oil prices to rise further if they do not cover transportation costs, Mr. Henderson replied that there has been no final decision on methods to be used, but that OPA is determined to hold the present price ceilings. It will not permit prices to rise to reimburse an industry for past losses, and will insist that at least part of extraordinary costs must be absorbed all along the line in order to hold existing price levels.

In answer to another question, however, he said he had no intention of holding a price schedule which puts people out of business, but that he does not believe that any major industry under a price ceiling is operating at a loss at present. He said that there are many alternatives to raising a ceiling such as distribution of the burden among various factors in the industry, adjustment of prices at different levels of distribution, handling special costs separately as is being done with sugar and coal, and the last ditch resort of a subsidy. He added that often an industry itself comes forward with suggestions for cutting or spreading costs in order to continue operating under a price ceiling.

Mr. Henderson's testimony thus failed to answer the question that is bothering both the oil industry and many others—how to keep from going bankrupt with prices frozen at March or earlier levels while costs are rising up to or beyond the ceiling prices.

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Complete Control of Tank Cars Assumed by Eastman's Office

WASHINGTON, D. C.—Complete regimentation of railroad petroleum-transportation facilities was assumed last week by the Office of Defense Transportation. General exemptions from the sweeping tank-car control order issued simultaneously removed much of the red tape for shipments into the two curtailment areas and for deliveries in other parts of the country 100 miles or more from the point of origin.

Joseph B. Eastman, director of ODT, issued the control order establishing a Section of Tank Car Service and stipulated that on and after June 1 no railroad will be allowed to accept for transport any loaded tank car without special or general permission, except cars specifically exempted.

One section of the order which calls on all railroads, tank-car owners, leasing companies or lessees to be prepared to move any or all tank cars in their possession upon instructions from the Section of Tank Car Service may tend to nullify a certain amount of the freedom expressed in exemptions. Tank-car operators serving interior points may find the permission to continue deliveries at points 100 or more miles distant from refineries meaningless, if ODT elects to divert the necessary equipment to other services.

An exception order issued simultaneously with the general order exempts cars used for transporting petroleum into 17 eastern states and the District of Columbia and into two northwestern states.

The exception order (ODT 7-1) also exempts cars used in hauling any commodity for a distance of more than 100 miles over the shortest available published rail tariff route.

The main order (General Order ODT 7) specifically exempts tank-car shipments consigned by or to any government agency.

Any person or firm may apply for special or general permission to move cars not exempted by the order by filling out forms to be provided by the Section of Tank Car Service.

Such applications must show the extent to which other methods of transportation, including tank trucks, are available for the hauls involved, the efforts which have been made to obtain other means of transportation, and other information.

In issuing special or general permits, the Section of Tank Car Service may specify commodities to be shipped, routes to be used, and other conditions of shipment.

Where tank cars are operated under the direction of the Section of Tank Car Service, their owners are protected from claims of violation of existing contract with respect to the use of the cars.

It also was emphasized that issuance of a special or general permit will not guarantee that a tank car will be available for the service contemplated. Such a permit merely will authorize movement of such a car over the rails.

The exception order specifically exempts the following shipments:

1. Crude petroleum and petroleum products into Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, and the District of Columbia.

2. Crude petroleum and petroleum products into the states of Washington and Oregon.

3. Any commodity billed to a point more than 100 miles from the shipping point by the shortest available published rail tariff route.

Mr. Eastman, in discussing the order, pointed out that the petroleum industry committees, working with Coordinator Ickes, have made great strides in stimulating the movement of tank cars into the Atlantic seaboard area.

"Just before Pearl Harbor," he said, "petroleum products were reaching this area by tank car at the rate of 70,000 bbl. a day. This figure has jumped to above 600,000 bbl. a day.

"Approximately 44,000 cars are in this service in the Atlantic seaboard area. Some of these have been borrowed from other service and some must be returned as seasonal requirements demand.

"At the same time, steps must be taken to move an even greater volume of petroleum products into this vital area despite curtailment of tank-car production.

"The saving of 1 car-day per trip for each tank car in petroleum service would be equivalent to adding 9,000 new tank cars to the present fleets.

"General Order 7 places all tank-car movements on a general or special-permit basis. For the time being, broad exemptions are made for movements of petroleum into the eastern seaboard, into Washington and Oregon and on movements of all commodities for distances of over 100 miles.

"Our Division of Motor Transport is surveying the tank-car situation in all areas. Wherever possible tank trucks are replacing tank cars, particularly for the shorter hauls.

"The rubber shortage may place a limit on this substitution, but in this immediate emergency, tank trucks are proving an invaluable aid in the transportation of essential liquids."

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W. D. Mason Heads New OPC Security Division

WASHINGTON, D. C.—W. D. Mason, superintendent of Sun Oil Co.'s Marcus Hook, Pa., refinery for 16 years, has been made director of the Facility Security Division of the Office of Petroleum Coordinator.

The division will coordinate and direct measures for the security of the nation's petroleum facilities and activities will be integrated with the program of the Office of Civilian Defense.

Mr. Mason's assignment, Deputy Coordinator Ralph K. Davies said in announcing creation of the new division, is that of:

1. Directing security work relating to all petroleum facilities.

2. Developing plans and procedures that will insure the protection of all vital petroleum products.

3. Representing the OPC in all matters relating to facility protection, including the coordination and approval of plans and programs developed by the various agencies within the industry and government concerned with problems of protecting plants.

4. Advising and consulting with other governmental agencies.

Majority of Cars to Receive More Than Minimum Ration

WASHINGTON, D. C.—The 3-gal.-per-week gasoline ration to passenger-car owners in eastern states announced by the Office of Price Administration over the past week end is considerably below the average gallonage which will be used by motor vehicles during the period of temporary rationing from May 15 to July 1.

Three gallons is the "unit" which may be bought with a single coupon, of which the pleasure driver gets seven for the 6½-week period, but holders of these "A" ration cards represent only one-third of all vehicles in the ration area, and are allotted only about 12 per cent of the gasoline.

The general average will be much above this figure because all commercial vehicles, trucks and tractors are exempt from the rationing system, all "essential" vehicles not readily recognizeable as commercial vehicles get "X" cards enabling them to purchase unlimited quantities of gasoline, and those who must drive to work get "B" cards permitting them to buy either 11, 15, or 19 units during the temporary ration period.

After July 1 a permanent coupon system of rationing will be in effect which will be based more nearly on essential uses of both passenger and commercial vehicles, and dealers will have to turn in collected coupons in order to replenish their supplies.

The temporary ration plan is often referred to by OPA officials as a "meal ticket" or "honor" system. Each user is given the type of ration card entitling him to purchase the amount of gasoline he says he needs, and the dealer simply punches or tears off one square for each unit of 3 gal. purchased. The "A" cards issued to all motorists not claiming special needs are admittedly simply convenience allotments and are not based on need at all. In fact, Price Administrator Leon Henderson told the House petroleum subcommittee last week that under this system the pleasure driver is getting "a damn sight more than he is entitled to" considering the gasoline supply on the East Coast.

The 3-gal. value for the unit was set by OPA on the basis of supply figures furnished by the Office of Petroleum Coordinator. Last week the War Production Board, on recommendation of OPC, ordered a curtailment of 50 per cent below calculated normal demand in deliveries of both gasoline and light heating oils in the 17 eastern states beginning May 16. While details of the various adjustments required by this deduction were not available pending promulgation of an amendment to WPB Limitation Order L-70, it was estimated that the order would leave only 401,784,000 gal. of gasoline available for use in private passenger cars during the 47 days of the temporary rationing period. This figure does not include consumption by commercial vehicles and nonhighway users.

Will Tabulate Ration Cards

As soon as possible, after gasoline rationing registration is completed this week, OPA will make a tabulation of the cards to form the basis for its permanent rationing system, and it is possible that the 3-gal. unit may be changed before July 15 if this analysis should show preliminary estimates wrong.

Mr. Henderson explained to the House subcommittee that the public had responded well to necessary curtailment requests, but with gasoline deliveries to service stations cut 50 per cent below normal it would place too much of a burden on retailers to ask them to ration their supplies among customers on the basis of their own estimates of essential uses, so it was decided to adopt a temporary ration system until a better one could be set up. He said he hoped this "honor system" would work during the interim period and that OPA would not have to ask local rationing boards to police unlimited users to prevent abuse.

While some readjustments may have to be made during the 7-week temporary period, Mr. Henderson told the committee that there is no possibility of the unit quantity being increased. Any increase in shipments into the eastern area will be compensated for by the seasonal increase in the base which determines the 50 per cent cut in dealers' deliveries, and if there is any surplus it should be used to build up storage, he said.

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Pipe-Line Link Arranged

WASHINGTON, D. C.—OPC will issue within a day or two a formal directive approving plans which committees of the Petroleum Industry War Council have drawn for re-laying used pipe lines and connecting with existing lines to move additional oil from the Mid-Continent to the East and directing that several of the projects be carried out as soon as possible.

Meanwhile, word reached OPC Monday that work has started on the first of these projects which will provide a direct line from Texas to Atlantic Coast refineries to move 25,000 bbl. of crude per day.

The first part of the project calls for taking up 111 miles of 8-in. line in Texas and using it to loop the Texas Co.'s line from Dallas to Tulsa or Cushing, Okla., to increase the capacity of this line by 15,000 bbl. daily. This will be completed early in July.

The Texas-Empire line from Cushing to Sheldon, Mo., will be increased 20,000 bbl. and from Valley Center, Kans., to Sheldon by 11,000 bbl. by installation of additional pumping equipment and 30 miles of looping with 12-in. pipe on hand. This section should be in operation early in June.

These operations will deliver an additional 30,000 bbl. daily to Chicago, of which 25,000 bbl. can be piped to Lima, Ohio, in existing lines, 20,000 by Indiana Pipe Line Co. and 5,000 via the Stanolind system. Illinois Pipe Line Co. will remove an idle 8-in. line from Ellwood, Ind., to Latonia, Ky., and with other 8-in. pipe available will lay 150 miles along its main line from Lima to the Pennsylvania border where it will connect with the Tuscarora line which will be reversed.

With additional pumping stations, this will increase capacity by 15,000 bbl. daily. Buckeye Pipe Line Co. will make improvements to its system to enable it to carry 10,000 bbl. additional to the Pennsylvania line.

By this plan 20,000 bbl. daily will be put into the Tuscarora line at Nagley and 5,000 will be used to keep other eastern lines continuously full to Bayonne. This will be the first all-pipe-line link from the Southwest to Bayonne and will handle 25,000 bbl. of crude daily, replacing 17,000 average tank cars. The full system is expected to be in operation by the end of the year.

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Coordinator Ickes Disclaims Any Part in Rationing Plan

WASHINGTON, D. C.—Complete disclaimer of any part in the gasoline-rationing program which becomes effective May 15 in 17 eastern states and the District of Columbia was made last week by Petroleum Coordinator Ickes.

"It is the function of the Office of the Petroleum Coordinator," declared Mr. Ickes, "to see that necessary petroleum supplies are always available to the armed forces of the United Nations and, so far as conditions make it possible, to see that there is petroleum for civilian use. We are working closely with the oil industry to get all possible supplies to the East Coast.

"The function of rationing those supplies after they get to the East Coast belongs to the office of Leon Henderson. The Office of the Petroleum Coordinator has cooperated with Mr. Henderson heretofore and will continue to do so in all ways.

"It is his responsibility to ration. He is doing a conscientious job. We will assist him in every way that we can."

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War Production Board Approves Fuel Rationing

WASHINGTON, D. C.—The War Production Board Monday gave the Office of Price Administration formal authority to put into effect the gasoline-rationing program already announced to start May 15 in the East. The directive restricts the authority to the states of Connecticut, Delaware, Florida east of the Apalachicola River, Georgia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, West Virginia, District of Columbia and the corporate limits of Bristol, Tenn., and to any point within 50 miles of the boundaries of these areas. This is the area where a 50 per cent cut in gasoline deliveries is to be made effective by distributors, but WPB said the 50 per cent cut will not necessarily be made in all the areas covered by the rationing directive. Formal orders giving details of the 50 per cent cut are still in preparation.

Meanwhile, OPC recommended that 93 western counties in five of these states be temporarily lifted from the curtailment area which presumably also will exempt them from rationing. To be excluded are 10 counties in New York, 25 in Pennsylvania, 1 in Maryland, 47 in West Virginia, and 10 in Virginia.

This will run the curtailment line from just east of Rochester south to Whitesville, N. Y.; west of Altoona, Pa.; west of Cumberland, Md.; east of Elkins, W. Va.; to the North Carolina line east of Marion, Va.

OPC recommended that no gasoline originating east of this line be permitted to be shipped west except tank-truck deliveries within the normal trading areas of border-line bulk plants.

The action was taken because of large production of gasoline as a byproduct of lubricant production in this area; but OPC announced that when stocks decline in this area it will again be placed under delivery curtailment.

Natural Gas News

All Branches of Natural-Gas Industry Share Responsibilities of War Supply

NEW ORLEANS, La. — Responsibilities of the natural-gas industry in the war program are manifold and are equally divided between the producing and transmission branches, B. R. Bay, president of Northern Natural Gas Co., Omaha, Neb., declared here last week at closing sessions of the annual meeting of the Natural Gas Section, A.G.A.

Mr. Bay has been nominated as next year's chairman of the Natural Gas Section and is chairman of the District 2 natural-gas committee of the Office of Petroleum Coordinator.

His remarks follow:

The problems of the natural-gas industry, so far experienced in this war emergency, have been fewer and much less complicated than those of the oil industry. This does not imply that our industry was better prepared as it is due in the main to certain fundamental differences in the manner of delivering our product from the well to the consumer as compared with the methods employed in transporting oil and its product.

As you all know, the water-borne shipments of oil, which constitute more than a third of the total requirement of our country, have suffered most interference because of war conditions. Staff members and the various oil committees appointed by the petroleum coordinator are diligently striving to overcome this dislocation and thereby correct conditions of actual shortage, and those which appear imminent. These efforts are meeting with considerable success.

Although our industry continues to function along somewhat normal lines, we are faced with many new and added responsibilities. Greater need for the maintenance of adequate gas supplies has never existed in the history of the natural-gas industry. The accomplishment of this objective spreads equally to the production of gas at its source and the proper maintenance of transmission facilities if we supply the greatly increased needs of this abnormal war market for natural gas.

It is conceivable that to some extent the recent limitation orders of the War Production Board, L-79 and L-31, will have the effect of balancing demand with existing transmission capacity and in such manner relieve some of the need for expansion of facilities. Narrowing this brief discussion, I might say that while District 2 produces substantial amounts of natural gas, much is imported into the area from District 3, the principal outside sources being the Monroe and Texas Panhandle gas fields. Similarly, some gas produced in District 2 is delivered to markets in Districts 1 and 3.

The current yearly rate of gas production from wells located within District 2 is about 400 billion cubic feet, most of this originates in the states of Kansas and Oklahoma.

There are approximately 30 principal gas pipeline systems, small and large, operating within the district, and the present yearly volume of natural gas sold in the area, for domestic, commercial, and industrial consumption, is about 600 billion cubic feet.

Customers, including those supplied with mixed natural gas and manufactured gas, approximate 3,400,000 in number.

The Natural Gas and Natural Gasoline Committee for District 2 held its organization meeting on January 26, 1942. To date the committee has met three times. Its personnel is made up of the following men, all of whom are well grounded by experience in all phases of the natural-gas and natural-gasoline industries:

A. W. Ambrose, vice president, Cities Service Gas Co.; Joseph K. Bowes, president, Oklahoma Natural Gas Co.; Edward Buddrus, superintendent, gas and gasoline department, Phillips Petroleum Co.; E. V. Kesinger, general superintendent, Natural Gas Pipeline Co. of America; Joseph A. LaFortune, vice president, Warren Petroleum Corp.; G. J. Neuner, vice president, Panhandle Eastern Pipe Line Co.; C. S. Sanders, general superintendent, Stanolind Oil & Gas Co.; H. M. Stalcup, vice president, Skelly Oil Co.; W. C. Taggart, Taggart Brothers; and T. J. Strickler, vice president, Kansas City Gas Co.

This committee, as may be said of all functional committees, is desirous of helping with natural-gas and natural-gasoline-industry problems where help is reasonably needed and in so doing, effectively cooperate with the Office of the Petroleum Coordinator, as the whole scheme of organization in the OPC is one of cooperative effort and some of the results obtained to date are little short of astounding. It is an outstanding example of representatives of Government and industry working hand in hand in a great crisis.

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Lone Star Accepts Uniform Gate Rate Ordered by FPC

WASHINGTON, D. C. — A lower uniform gate rate of 30 cents per 1,000 cu. ft. for natural gas delivered to 280 communities in Texas and Oklahoma by Lone Star Gas Co. will become effective May 15. The new rate of 30 cents corresponds to a previous gate charge of 40 cents.

The order establishing the lower rate was issued May 5 by the Federal Power Commission here following a conference at which a waiver of hearing and acceptance of the findings of the commission by the company and acquiescence in the order was expressed by the Railroad Commission of Texas, the Corporation Commission of Oklahoma and the Supervisor of Public Utilities for the city of Dallas, Tex.

The order makes effective the new uniform 30-cent rate on May 15 and obligates the Lone Star Gas Co. concurrently to make the entire reduction applicable to the domestic and commercial consumers it serves, including Dallas Gas Co., Community Natural Gas Co., and Texas Cities Gas Co. The estimated sum involved in the rate reduction, based on sales for the 12 months ended February 28, 1942, is $2,071,140.

The commission allowed the Lone Star Gas Co. a return of 6.5 per cent or $2,455,334 on a rate base of $37,774,368 in arriving at the new uniform rate. The rate base represents the original cost of the company's properties in the amount of $54,159,368, less accrued depreciation and depletion of $17,185,000, plus $800,000 working capital.

The commission found that the company's reasonable operating expenses are $5,327,746; annual depreciation and depletion, $1,677,534; and taxes, $1,585,459. These costs, together with return of $2,455,334, entitle the company to annual revenues of $11,046,073, the order indicates.

Lone Star Gas Co. owns approximately 4,400 miles of pipe lines in Texas and Oklahoma and transports natural gas, chiefly from the Texas Panhandle and East Texas.

Reserve Gas Pipe Line Co. Files New Application

WASHINGTON, D. C.—Reserve Gas Pipe Line Co., which proposes to build a 1,500-mile natural-gas pipe line from Texas and Louisiana to New York City has filed a new application with the Federal Power Commission here asking for a certificate of convenience and necessity.

Cost of the 24-in. main transmission line, to be operated at a pressure of approximately 1,000 lb. per sq. in., is estimated by the company to be approximately $80,000,000 "under normal conditions."

A similar application was filed with the commission August 8, 1940 (designated as Docket G-180), and the new application is similar, except that alternate routes are said to be under consideration.

The source of supply, it is stated, will be the Gulf Coast in which region the applicant asserts it is in position to secure a supply in excess of 4,500,000,000,000 cu. ft. of natural gas, and believes that this source has a proven and developed supply of 17,750,000,000,000 cu. ft. not now utilized. Preliminary studies of the market area made by the applicant indicates that its population exceeds 14,500,000 persons, and includes not less than 3,500,000 consumers of manufactured gas. The petition states: "In this area on the Atlantic seaboard in which applicant proposes to market natural gas there is presently no natural-gas service generally available. . . .

"Applicant does not propose to sell natural gas from its pipe-line system at retail, but proposes to sell such gas only to gas-distribution companies for their own use and for resale by them for ultimate public consumption for domestic, commercial, industrial or other uses, and to sell surplus gas to industrial consumers for their own use."

Cities Service Bid to Supply Navy Airfield Protested

WASHINGTON, D. C.—Cities Service Gas Co.'s bid to supply natural gas to the Navy airfield at Olathe, Kans., has been protested by Union Gas System, Inc. The complainant claims that it distributes gas in the Olathe area, that most of its normal supply is secured from local wells but that certain additional amounts of gas are purchased through a standby contract with Cities Service at a rate of 45 cents per 1,000 cu. ft.

Recycling News

Survey Completed for New Plant in Nueces County Field

HOUSTON, Tex.—Engineers recently completed a survey of the Shields field, Nueces County, Texas, in conjunction with the construction of a proposed 25,000,000 cu. ft. recycling plant which is scheduled to be built as soon as the necessary materials are available.

The survey was made for Stanolind Oil & Gas Co., Phillips Petroleum Co., and Fred W. Shields. The 6,900-ft. gas sand was estimated to extend over 1,250 to 1,500 acres and plans are under way to unitize the leases.

Los Angeles A.P.I. Holds Special Meeting Devoted to Protection

The Los Angeles Basin chapter of the Division of Production of the American Petroleum Institute, held a special meeting Tuesday, May 12, devoted to oil-industry protection through the Office of Civilian Defense. Speakers included Willard W. Keith, director, southern California sector ODC; A. C. Rubel, vice president, Union Oil Co., in charge of production, and chairman, oil industry committee; Capt. Albert N. Butler, U. S. Army, and Lt. Col. John F. Ohmer, Western Defense Command. An open forum followed the formal program, which was given over entirely to matters of defending the oil industry against attack.

Canadian Gas Association Outlines Program for 35th Convention

Six speakers have been tentatively arranged for in connection with the thirty-fifth annual convention of the Canadian Gas Association, which will be held at the Windsor Hotel, Montreal, June 4 and 5. The speakers, and their subjects, follow:

1. "Market Survey," by S. B. Severson and H. P. Nagel, Dominion Natural Gas Co., Ltd., Buffalo, N. Y.

2. "The CP Program—Its Accomplishments and Future," by E. C. Sorby, A.G.A.E.M.

3. "Difficulties With Shifting Soil in Maintaining a Gas Distribution System," by Alan H. Harris, Jr., Winnepeg Electric Co.

4. "Observations From Data Taken With a Flashback Instrument," by J. A. Morrison, Consumers Gas Co., Toronto.

5. "The Gas Meter," by J. D. Von Maur, Consumers Gas Co., Toronto.

6. "The Gas Industry's Activities in Wartime," by T. P. Pinckard, United Gas & Fuel Co. of Hamilton, Ltd., Hamilton.

East Texas A.P.I. Discusses Water Disposal at Spring Meeting

The East Texas chapter of the American Petroleum Institute held its spring meeting at Kilgore Tuesday evening, May 12. Bryan W. Payne, president, Iowa-Payne Oil Co., president of the East Texas Salt-Water Disposal Co., and an independent oil operator, discussed "The Production and Disposal of Salt Water in the East Texas Oil Field." Jerry Sadler, member of the Texas Railroad Commission, and vice chairman of the National Conference of Petroleum Regulatory Authorities, reviewed the current oil situation and its relationship to the war effort.

California Natural Gasoline Association June Frolic Announced

The 1942 June Frolic of California Natural Gasoline Association will be held at the Altadena Golf Club, Altadena, Calif., Saturday, June 6, 1942, according to the announcement of W. C. Dayhuff, C.N.G.A. president.

The event, annually sponsored by the association, will be an all-day outing featuring golf, baseball, tennis, swimming, badminton, and volley ball with free beer dispensed during the day. The frolic will be topped off with a barbecued spareribs buffet dinner to be followed with a stag show.

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DISTRICT 2
120 South La Salle St. Bldg., Chicago, Ill.

DISTRICT 3
245 Mellie Esperson Bldg., Houston, Tex.

DISTRICT 4
817 Seventeenth St., United States Natl. Bank Bldg., Denver, Colo.

DISTRICT 5
417 S. Hill St., 855 Subway Terminal Bldg., Los Angeles, Calif.

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Social Security Building, Fourth and Independence Ave., S.W. Phone Republic 7500

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Petroleum Unit (Temporary Building R).—W. G. Shallcross, business specialist, room 1709, extension 3722.

Bureau of Industry Branches.—Philip D. Reed, director, room 5420, extension 3394.

Petroleum Machinery and Equipment Section (Temporary Building, East, Seventh Wing, Third Floor).—A. E. Collins, chief, extension 5741.

Liaison With Office of the Petroleum Coordinator and Reconstruction Finance Corp.—R. O. McClintock, room 5193-A, extension 71181.

OFFICE OF PRICE ADMINISTRATOR

Temporary Building D

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Assistant Administrator.—George W. Stocking, in charge of fuels.

Fuels Section.—George Doffing, price executive, room 236, extension 5388.

Petroleum Unit.—Joseph Salmon, chief, room 2703, extension 6376.

Director of Gasoline Rationing (Temporary Building S).—Joel Dean, room 1048, extension 71322.

Oil-Field Equipment (Temporary Building S).—U. R. Laves, room 2639, extension 5167.

BOOKS

The American Petroleum Institute has recently published a 590-page volume, "Petroleum Industry Hearings Before the Temporary National Economic Committee." The testimony taken at the hearings covers several hundred pages, and is in question-and-answer form with numerous exhibits (statements, charts, tables, etc.) inserted. The testimony, as it appears in the official and unofficial record, is scattered and not readily available. The A.P.I. appointed a committee to study the record and to digest it into one narrative volume; and authority was given to publish the committee's digest. This volume is the result of the committee's work.

The book is copiously subheaded, and contains a complete and detailed index which, in effect, is a glossary of modern petroleum terms. The price of the volume is $3.

"Du Pont—One Hundred and Forty Years," by William S. Dutton (Scribners) is, to quote the foreword, a story of men and goods, of peace and war, of vision and venture. It is the biography of a business, and of a young nation on the march. The work is divided into four parts: Gunpowder, High Explosives, A New Century and the Plowshares. The various chapters of these parts tell the story of how the Du Ponts "put science into overalls and harnessed the laboratory with the factory."

DEATHS

HARRY J. JENNINGS, 78, one of the pioneer oil producers in the western Pennsylvania area, and a resident of Tidioute, Pa., died at a Warren, Pa., hospital last week after a short illness. His wife and a daughter survive.

CHARLES VERNON LEE, 63, president of Lee Petroleum Corp., San Angelo, Tex., died last week in a Houston, Tex., hospital. A native of West Virginia, Mr. Lee had been engaged in the oil business for many years. His widow, three daughters and a son survive.

CLEVE SCRANTON, 32, employe of Sinclair Prairie Oil Co., died at his home in Tulsa following a short illness. His widow survives.

A. J. BRODERICK, 47, oil operator of Fort Worth, Tex., for the past 23 years, died May 5 from a heart attack. Mr. Broderick was a partner with George Calvert in the firm of Broderick & Calvert, Inc. Mr. Broderick had operated in Arkansas and Louisiana before going to Fort Worth.

WILLIAM G. BREWSTER, pioneer oil-well surveyor, died at a Ventura, Calif., hospital, April 26. Mr. Brewster started in the surveying of oil wells in 1924 with Alexander Anderson. He went to Eastman Oil Well Survey Co. in 1932, where he was employed at the time of his death.

M. M. BATES, 59, scout for Humble Oil & Refining Co., died at Wichita Falls, Tex., last week. He had covered the North and West Central Texas district for more than 25 years. His widow and a daughter survive.

ENGINEERING *and Operating* SECTION

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Reclaiming Alloy Steel Parts

It is essential that all equipment made from alloy steels be repaired if possible. Means of extending the useful life of many irreplaceable items are described.

FOR the past 10 years there has been a slow but steady increase in the efforts of operators to rebuild, recondition and reclaim various items of equipment which are partially worn. Such items may be entirely unfit for further service and yet be in such a condition that they can be rebuilt so their life of usefulness is extended.

In the past few months the incentive to do work along this line has been greatly increased. This is due to the fact that much of the equipment which formerly would have been discarded to be replaced by new is made from alloyed steels which are no longer available to former users. This includes high-pressure refinery valves, steel forgings, chrome forgings, stainless-steel forgings, pump rods, engine valves, gears, sprockets and practically the entire drilling rig, rooter teeth for graders, drag bits and a large number of other similar items. The elements, chrome and nickel, are particularly hard to obtain, and any equipment made from alloyed steels should be preserved at all costs as replacements are practically impossible to secure.

Repair work on such items, however, carries a very high priority rating, principally because it is possible to rebuild an item and put it in condition, practically as good as new, with a very small amount of additional metal. It is also possible to make some items, particularly rods, with a core of cold-rolled steel, covered with a sheath of stainless steel.

Repair of Valves

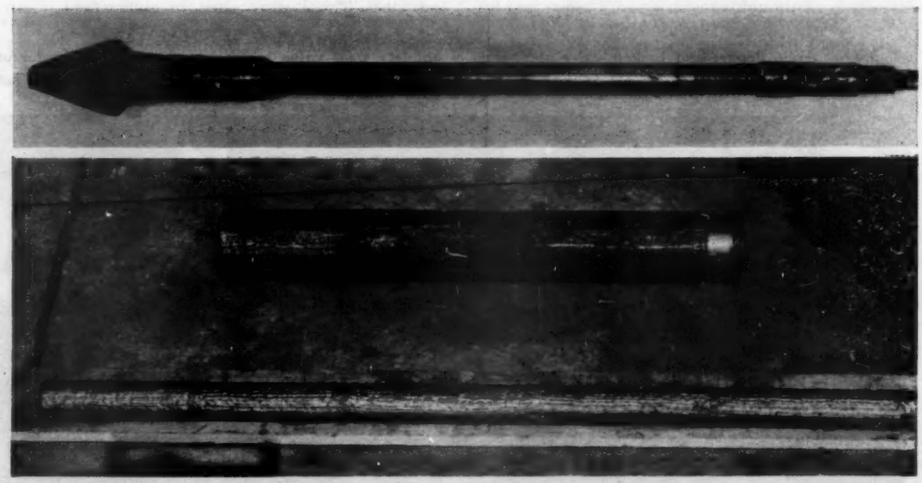
In repairing large valves made out of special stainless steel and other high alloyed materials, it should be remembered that considerable time is required to perform a good job. The procedure normally is to cut out the worn portion of the valve, rebuild it with suitable metal applied by the electric and/or acetylene welding method and then grind the repaired surface to the desired shape. It takes a minimum of 60 hours to repair the seat flapper and flanges in a 6-in. valve. If an effort is made to rush the job it may have to be done over entirely. It is best to repair valves immediately after taking them out of service and not wait until they are needed.

Valves of this type are generally made out of ¾-in. stainless steel. Generally these will be from 18-8 chrome nickel, 25-12 chrome nickel or 25-20 chrome nickel. A 4.6 chrome rod may be used to rebuild the valve.

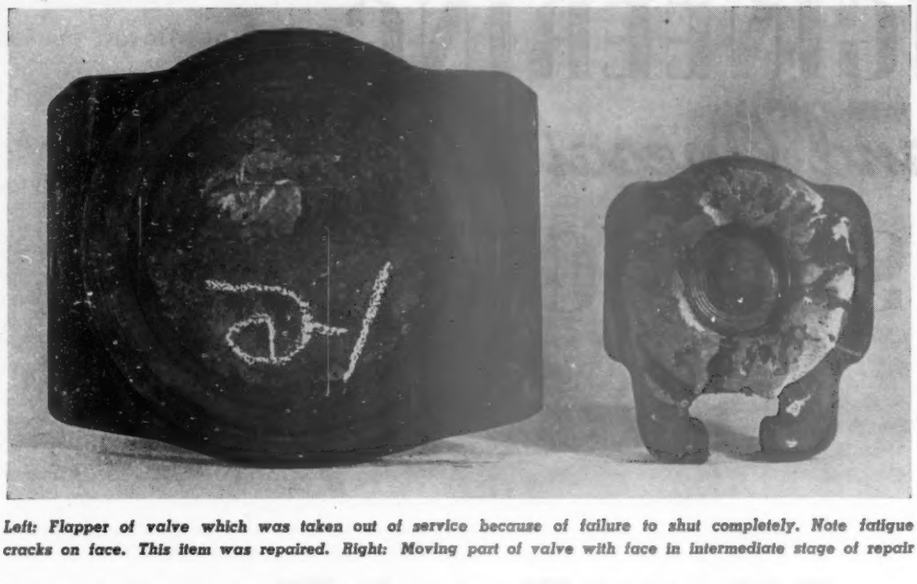
Valves are reheated to 1,500° with blow pipes or by placing the valve in a furnace. Cut-out portions of the valve are built up with an electric stainless-steel rod which is ground down and then covered with a hard facing pad applied by the acetylene method. This is then ground to the proper shape. The worn spots may be either chipped, ground or puddled out so that fresh metal is exposed for the application of new material. Valves with the bodies, seats, flanges and flappers almost entirely cut away have been successfully and economically reclaimed by this method. A broken stem can have a new rod welded on and threads turned on it so it is as good as new.

When sending a valve in for repairs it should be accompanied by a detailed drawing or specifications so that the valve may be rebuilt to precision measurements. If any part is missing, a drawing of it can be used to fashion a replacement.

Valve castings which ordinarily would be re-



Top: Steel rod clad with hard-facing which can be used in place of solid stainless steel rod. Middle: Pump rod rebuilt and clad with work-hardening metal. Lower: Valve stem partially repaired. Badly corroded spear-point was undercut and rebuilt and a new piece welded on threaded section which had been broken off



Left: Flapper of valve which was taken out of service because of failure to shut completely. Note fatigue cracks on face. This item was repaired. Right: Moving part of valve with face in intermediate stage of repair

jected by the inspector, due to pin holes or other defects, can be reclaimed by preheating, filling with hard metal and then grinding down. In one case where the flange holes had been drilled in the wrong position, it was possible to refill the holes and drill new ones in the proper place.

Cost of such work naturally runs high as a skilled workman must concentrate on this work for a large number of hours. However, a valve which is entirely worthless can be made as good as new for approximately two-thirds of the cost of the original valve. While an operator in normal times might debate whether to have such a valve rebuilt at the present time he has little choice as there are no new valves available. In addition he may have the rebuilt valve equipped with a special coating or lining which will resist corrosion and abrasion as well as the original.

Pump Rods

Most rods used in piston-type pumps are made from solid stainless steel. In the past, when these rods became worn to the point where it was impossible to keep packing in the glands, they were discarded and new ones installed. There are now very few new rods available, and before long there will be none at all. Consequently, if many pumps are to be kept operating reclaimed rods will have to be installed. Any pump rods now reposing in the junk pile should be reclaimed immediately, even though they are badly worn and appear to be utterly useless.

The procedure for reclaiming pump rods is to undercut the rod to the point of maximum wear, after which it is built up with stainless steel to beyond its original diameter. It is then undercut from $\frac{1}{16}$ in. to $\frac{1}{8}$ in. and rebuilt beyond its original diameter with hard-facing material. It is then ground down to the finished measurements. It is possible to rebuild a rod in this manner to 0.005-in. precision.

Improved performance can be obtained from rebuilt rods if the final wall of material is the work-hardening type. Original Brinell hardness of a new rod may be in the neighborhood of 260. The layer of work-hardening material, when newly applied, will be in the neighborhood of 230 Brinell. However, after being in operation for a short time this material is work-hardened to 600 Brinell.

In doing work of this type the rod is slightly distorted by the heat of welding, but it is straightened before being ground to its final finish and no trouble will occur from a bent rod. Where the thread end of the rod has been damaged, it also can be rebuilt and rethreaded or a new length of rod the proper diameter can be welded on and ground down. Actually, when finished, it is difficult to determine where the rod has been welded.

The oil industry formerly used large quantities of cylindrical bars of 18-8 chrome nickel, stainless steel. These were used in subsurface pump plungers, polish rods, etc. Such a rod is highly resistant to corrosion, wears well and has good fatigue characteristics. Two-inch rods of this type contained approximately 169 lb. of chrome and 75 lb. of nickel per 1,000 lb. of rod.

By using a core of 3140 steel and then overlaying this with stainless steel, a satisfactory substitute may be obtained. Such a rod will contain approximately 24 lb. chrome and 11 lb. of nickel per 1,000 lb. of rod. This results in a saving of 145 lb. of chrome and 64 lb. of nickel per 1,000 lb. of finished rod. The 3140 steel also contains chrome and nickel, although this steel is still available in limited quantities. Some work has already been done on rods having a core of 1120 cold-rolled steel, and it is expected a satisfactory rod of this type can be developed.

Engine Valves

Intake and exhaust valves on large engines will be difficult to obtain in the near future. In fact a number of operators have found it impossible to secure such replacements already.

Even in the most extreme cases where the valves are badly damaged and even broken, they can be repaired and rebuilt satisfactorily. A valve containing 10 lb. of stainless steel can be repaired with 9 oz. of new stainless-steel metal. Where the valve face is damaged, it can be undercut and new stainless steel applied by the acetylene-welding method. After being ground down to the proper size, such a refaced valve will last almost three times as long as a new valve.

The reclamation of gears and sprockets is simple in comparison to the repair of refinery valves, pump rods, etc. The same is true of drill pipe, slips, etc., which do not require precision work. The main factor is a knowledge of the composition of the metal. Satisfactory work of this type can only be done by one who knows the characteristics of the metal being repaired and the characteristics of the metal being applied. An attempt to recondition any equipment by an amateur will generally lead to its ruination.

An interesting sidelight, which indicates some of the problems encountered in this work, is the repair of refinery gate valves. It was found that the valves in certain refineries could not be repaired with ordinary type welding rods, due to the fact that the metal in the valve had absorbed considerable sulfur compounds from the oil. A welding rod, containing copper, which had been satisfactory for the repair of most valves was found to be entirely unsuitable as the sulfur reacted with the copper in it. A change in the type of rod used on valves in refineries handling sour crude is necessary.

Left: Bonnet and broken valve stem from a stainless steel valve which was repaired by undercutting and rebuilding with the proper metal. Right: Body of a stainless steel valve for which it was impossible to obtain a replacement. It was successfully rebuilt and placed back in service

Mud Control Saves Steel

WITH the present necessity for minimizing the use of steel in any form, mud engineers for some oil companies have accomplished remarkable results in eliminating long strings of casing by intelligent and skillful mud control and by a willingness to spend an increased amount of money to carry out a suitable mud program in order to make a much greater saving. Reference to some specific examples may be of interest and possibly serve as an indication of savings which may be accomplished in other fields.

In one field in which wells are drilled to approximately 6,500 ft., the following casing program has been customary: 600 ft., 13⅜-in.; 5,600 ft., 11¾-in.; 6,500 ft., 9⅝-in. Native mud weighing approximately 82 lb. per cu. ft. has regularly been used in these wells.

Recently in this field several holes have been drilled in which by using 98 instead of 82 lb. per cu. ft. mud, about 5,600 ft. of 11¾-in. casing has been eliminated. Careful mud control was maintained and a sufficient amount of colloidal clay added to keep the water loss and cake thickness at a minimum. Suitable chemicals were also used to further decrease water loss by keeping the colloidal material in dispersion and to control viscosity and gel strength. The control resulted in saving approximately 140 tons of steel per hole, and, though the monetary saving effected was of less importance, the operator actually saved about $12,000. Not included in the above estimate of savings are costs which were also eliminated such as for casing shoes, float collars, cement, cement equipment, shutoff tests, extra rig time, and wear on wire line. Another notable example is a completion just made in which, by comparison with previous wells in the same area, 6,500 ft. of 11¾-in. casing was eliminated. Although approximately the same weight of mud was used in both the wells, extremely careful attention was paid in the second well to the water loss and cake thickness. More colloidal clay was used and pyrophosphate and quebracho employed which resulted in a minimum water loss. Although a persistent loss of circulation occurred in a certain section of this hole and it appeared at first that it would not be possible to carry the elevated mud weight necessary to keep the shale from sloughing, increased amounts of colloidal clay and Micatex eventually reduced the loss so that a weight of 90-92 lb. could be maintained.

In several deep fields in California a shale body is encountered between 7,000 and 8,000 ft., which is commonly known as bentonitic shale. In the first well drilled, this shale had a tendency to slough and cause considerable trouble, and it was originally thought that a string of 8,000 ft. of 9⅝-in. casing would be necessary. However, by elevating the mud weight to 90 lb. per cu. ft. and keeping the water loss at the lowest possible point, operators found that they could drill the wells to the final depth without the use of this string. Many specific instances of casing-saving programs are available which have been effected entirely by careful mud control, in some instances without the necessity of increasing the cost of mud. Other cases do require an additional expenditure for increased mud weight, but in most of these the money saved by eliminating casing will be two or three times more than the extra money spent for mud.

In a certain field in Louisiana it has been customary to set anywhere from 1,800 ft. to more than 3,000 ft. of 10¾-in. surface casing. Due to an operator's inability to obtain more than 1,050 ft. of the 10¾-in., he decided to take a chance with just that amount. No trouble was encountered until the weight of the mud was increased to 13.3 lb. per gal. (99.5 lb. per cu. ft.) when the hole began taking mud at the rate of approximately 300 lb. every 8 hours. The addition of 5,000 lb. of Micatex stopped the loss, whereupon the mud weight was increased and maintained between 16.4 and 16.6 lb. per gal. (122.7 and 124.2 lb. per cu. ft.) without further trouble even though the formation down to about 3,000 ft. consisted of sands, gravel beds, and broken material.

The results obtained by mud engineers in some fields are so gratifying that it is quite likely that a careful analysis of casing programs in many fields with due regard to the drilling conditions and a well-planned mud program can result in similar savings for other operators.

Baroid Sales Div. National Lead Co.

Maintaining Safety Equipment

WITH the critical scarcity of rubber, the regular care and maintenance of dust respirators and gas masks becomes vitally important. A material part of both these safety items consists of rubber, and replacement will naturally become difficult. Furthermore, the protective value of such safety equipment is impaired unless it is kept in good condition.

Regarding the actual cleaning and sterilizing operations, the simplest and most effective method is the use of warm water, soap, scrubbing brush, and an approved disinfectant solution. Very hot or boiling water should be avoided, as repeated application tends to harden the rubber parts. After a thorough washing, rinse the parts in warm water and dip them in a diluted disinfectant solution. A 3 per cent solution of carbolic acid or a 2 per cent solution of Lysol is recommended. Also after washing, complete sterilization can be accomplished by immersion for 10 minutes in a solution of formalin, consisting of one part of 40 per cent formaldehyde solution in nine parts of water.

Following immersion in the disinfectant, the parts should again be thoroughly rinsed and allowed to dry, and then reassembled, using new filters in the case of respirators. When not in use, the equipment should be kept out of direct sunlight, as sun has a deteriorating effect on rubber.

To keep the respirators sterile until used, put each one in an ordinary paper bag, fold over the top and fasten with a stapling machine. Mark the respirator number on the bag and deliver it to the employe or to a central distributing point.

The length of time between sterilization depends entirely upon the use to which the mask or respirator is subjected; in some cases once or twice a shift; in others once a week is enough.

Depending upon plant conditions, an efficient means of cleaning is in the use of a central maintenance system. Under this plan, one man or department has the responsibility of cleaning, sterilizing, repairing the equipment, and issuing it to the men. When this maintenance work is done during the regular shift, it is advisable to provide, in the case of certain equipment, a duplicate set.

The same mask or respirator should always, if possible, be given to the same man. For this reason, it should bear some individual identification mark such as a stamped or stenciled number. Workmen should be able to get clean equipment at any time. A record should be kept establishing the hours of use between sterilizations and the dates and times of sterilization.

Care must be taken not to damage the unit when not in use. The practice of carrying a respirator in a tool kit is quite common, yet is extremely harmful to the unit. Sharp tools may puncture the filters or the facepiece, or heavy tools may crush it out of shape. In addition, the oil, grease, and dirt are harmful to the rubber parts and to the filters. If the worker insists upon storing his respirator in his kit, make sure some type of protective container is furnished for the device. Respirators, gas masks, or rubber gloves should never be put away while damp; moisture is harmful to rubber under such conditions, and tends to give it a "set position." When not in use, they should be stored in a moderately cool place.

Common sense plays a great part in the care and maintenance of all safety equipment. Most protective hats and goggles can be cleaned with ordinary soap and water and can be sterilized with a solution similar to that used for masks and respirators. Keep in mind that all of your safety equipment will give better service for longer periods of time when kept clean, handled carefully, and repaired promptly.

Courtesy Mine Safety Appliance Co., Pittsburgh, Pa.

Use of Soil Surface Potential in Locating Pipe-Line Corrosion

By O. C. MUDD
Senior Corrosion Engineer, Shell Pipe Line Corp.

WHEN new pipe lines are planned or built, the location of probable corrosion can be predicted with fair accuracy by means of soil tests made along the route; however, the degree of corrosion can be measured only as it develops.

This article describes the principles and a technique for locating pipe sections now corroding in existing lines, and for measuring the relative degree of corrosion activity. The actual nature and severity of corrosion then can be determined by uncovering the line and making visual inspections.

Electrical Action Resulting From Corrosion

The term "iron," as used in this article, refers to the usual commercial grades of steel in line pipe. It is well known that the refining of iron requires heat or electrical energy to reduce the metal from its natural stable compounds. The iron retains stored energy with reference to elements and compounds which, through contact, tends to reunite and again convert it to a stable compound. When soil elements and compounds combine with the pipe metal, this stored energy is freed, and at least a portion of it is changed to electrical energy and sets up an electrical potential between the soil and pipe.

The potential difference or voltage in a common dry cell is caused by two different elements in contact with a chemical solution or electrolyte. This potential difference causes current flow in an external circuit connecting the two elements and completes the circuit through the electrolyte that also supplies chemicals required by the corroding electrode to maintain current flow. Similarly, voltage can be set up by the contact of a single metallic conductor, such as a pipe line, with two different types of soil electrolytes which are themselves in contact. These electrolytes may differ either in composition or in concentration of the same chemical. Battery action and current flow are completed through the circuit formed by the metallic pipe and the soil electrolytes. The last-described conditions are common along pipe lines in certain areas because the composition and concentrations of soil chemicals vary in innumerable combinations.

The sections of a pipe line exposed to the more concentrated chemicals usually suffer the greatest corrosion and are known as "anodic" sections. An anodic section or "anode" is one from the surface of which electric current passes to the contacting electrolyte and carries with it particles of metal, thereby causing a reduction of the anode. These infinitesimal particles or "ions" serve as vehicles to carry the electric charges through the electrolyte to another portion of the pipe surface termed a "cathodic section" or "cathode."

The potential differences that cause current to flow from anodic sections of a pipe line are set up by the iron ions as they enter the electrolyte where they combine with soil chemicals, give up their charges, and liberate hydrogen ions that in turn carry the electrical charges to the cathodic section where the hydrogen is deposited. No metal reaches the cathode in this process. A cathodic section when covered with a hydrogen film is said to be "polarized." Heavy polarization may stop the current flow and, consequently, the further escape of metallic ions from the anodic section. Under field conditions these hydrogen ions usually combine with the soil chemicals, so a state of polarization is seldom found on pipe surfaces when the source of energy comes only from pipe-line corrosion.

Helmholtz stated one of the electrical laws as follows: "Any ion leaving an anode imparts an equal and opposite charge to the surface it leaves." This action is illustrated in Fig. 1, which represents the cross-section of a dry cell with the terminals connected through a low-resistance conductor. The potential difference which causes the flow is set up by release of the stored energy or "heat of formation" in the zinc ions that leave the zinc anode to combine with the electrolyte chemicals. These ions are positively charged and, as pointed out by Helmholtz, impart an equal negative charge to the anode upon separation. The positively charged ions travel through the electrolyte and deliver their charges to the cathode, thereby making it a positive terminal and causing a current flow from it through the external circuit to the anode. The corroding surface or anode is negative to the electrolyte and is the negative terminal of the external circuit.

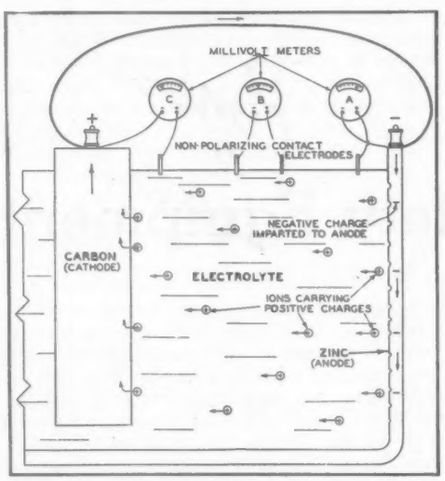


Fig. 1 (above)

Observations with millivolt meters and non-polarizing electrodes in contact with the electrolyte as shown in positions *A*, *B* and *C* of Fig. 1, will indicate the following:

A. A voltage between the zinc and the electrolyte of greater magnitude than the differences noted in subsequent positions, and the zinc negative with respect to the electrolyte.

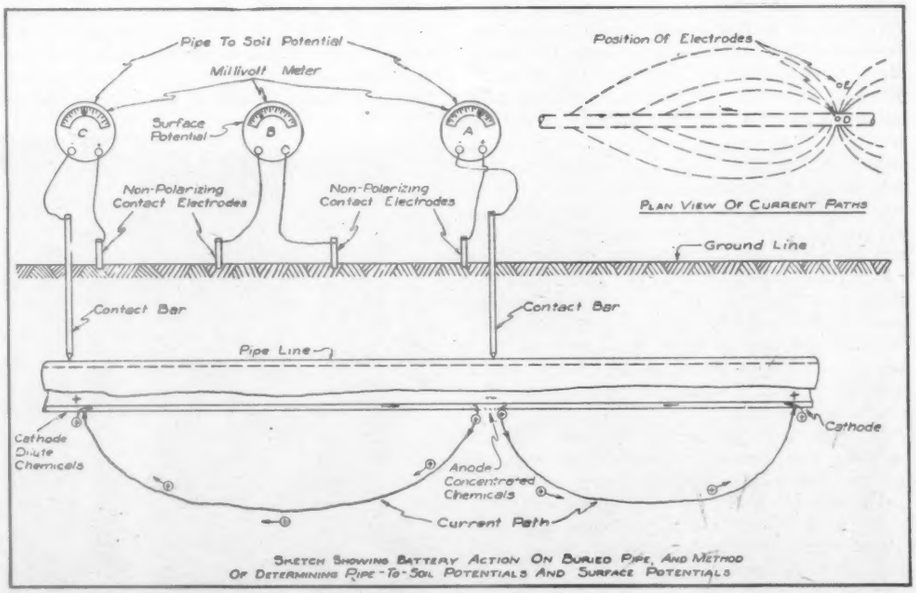
B. A voltage drop between points on the surface of the electrolyte, with the electrode nearer the anode positive with respect to the electrode nearer the cathode, indicating a current flow from the anode to the cathode. The magnitude of this voltage drop depends on the resistance of the electrolyte and the current flow.

C. A voltage between the electrolyte and the cathode, and the electrolyte positive with respect to the cathode. The magnitude of this voltage depends on the cathode contact resistance, and the resistance of the external circuit, and it will increase with polarization of the cathode.

The voltage observed in position *B* results from the conditions stated in Ohm's law, i.e.:

$$\frac{E}{I} = R \quad \text{or} \quad E = RI$$

where
E = voltage between contact points.
R = resistance of circuit involved.
I = current flowing in circuit.

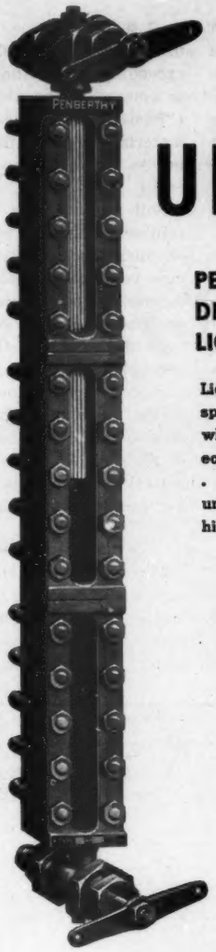


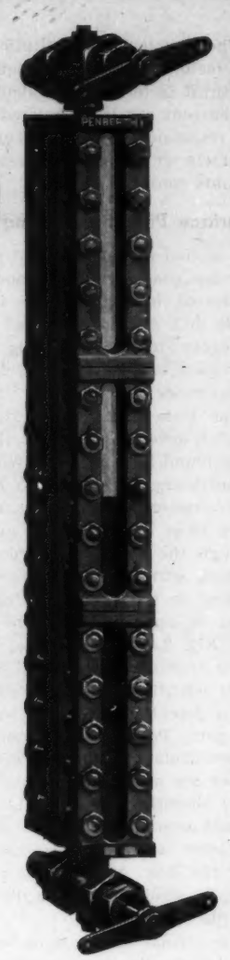
SKETCH SHOWING BATTERY ACTION ON BURIED PIPE, AND METHOD OF DETERMINING PIPE-TO-SOIL POTENTIALS AND SURFACE POTENTIALS

Fig. 2 (below)

Author's title: "Locating Pipe-Line Corrosion by Soil Surface Potential Measurements."

QUALITY UNCOMPROMISED





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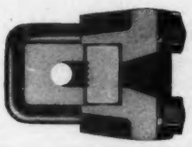

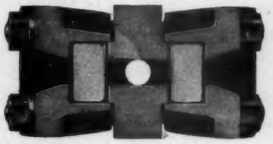

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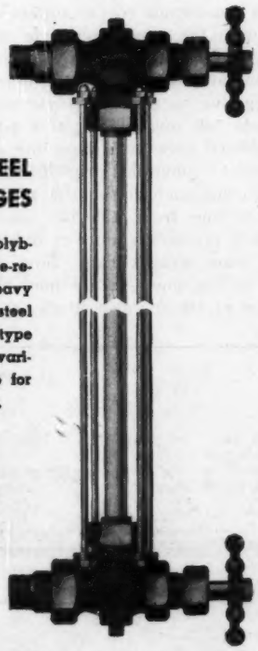

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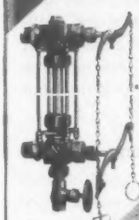

"Navy Type" Liquid Level Gage

"Safeguard" Automatic Liquid Level Gage

"All-Iron" Automatic Liquid Level Gage

Gas Engine Lubricator

Snap Lever Oiler

Plain Brass Oil Cup

Plain Compression Grease Cup

Screw Plunger Grease Cup

Spring Compression Grease Cup

Automatic Electric Sump Pump

Automatic Cellar Drainer (Water or Steam Operated)

Dipless Air Cock

When numerical substitutions can be made for two factors in the above equation, the value of the third factor can be calculated; consequently, the current can be calculated when the potential and resistance is known. This current will vary inversely with changes in resistance if the voltage remains constant.

Surface Potentials Along Corroding Lines

A section of pipe exposed to variations of soil chemical concentration produces battery action as illustrated in Fig. 2. The illustrated locations, *A*, *B* and *C*, for electrical measurements are analogous to those in Fig. 1, with the pipe analogous to the external circuit conductor between anode and cathode.

Pipe lines in contact with varying soil electrolytes develop potentials that are lower than those found in commercial batteries, but they are of sufficient magnitude to be detected with a millivoltmeter. These potentials cause current flows from the relatively small anodic sections through the soil to the larger adjacent cathodic sections, with distribution along curved paths according to the resistances encountered, and returns in opposite directions through the pipe. (See Fig. 2.)

The resistance of the soil to current flow produces potential gradients along the paths involved, i.e., a potential difference between points along any path. Points of equal potential fall in planes perpendicular to the current paths and these planes are also perpendicular to the axis of the pipe; therefore, in order to accurately measure voltage drop between points along a pipe line, it is necessary to place the contact electrodes directly over the line. An electrode placed at position *E* (Fig. 2) would produce a different reading from one placed at *D*.

The normal voltage to be found between a commercial pipe-line iron immersed in an electrolyte and a concentrate copper sulfate electrode in contact with the same electrolyte is 540 mv. when the iron surface is free of corrosion products and no ions are leaving or being deposited. The iron is negative to the electrolyte when the voltage exceeds 540 mv. A negative potential may be established between a pipe line and the contacting soil by potentials originating at the pipe surface during corrosion and/or potentials impressed on the line from external sources; e.g., from cathodic protection units or industrial equipment that cause stray current flow. Corrosion products on the pipe surface may alter the normal voltage of 540 mv. more than 100 mv. under some conditions, so the indications along a buried pipe can best be determined by the relative potentials between adjacent points. However, such relative potentials are useless as indicators to detect pipeline corrosion if electric currents originating from other sources than corroding pipe are present along the line section.

The principles governing the detection of corrosion activity on pipe lines may be summarized as follows:

1. Corrosion is most active where the negative pipe-to-soil potential is greatest relative to adjacent sections.

2. Current always flows through the soil from anodic to cathodic sections of the line.

3. A current flow through the soil produces a voltage drop that can be measured along the ground surface above the pipe line.

A measured voltage is one factor in Ohm's equation. Soil resistance is the main factor limiting current flow from potentials associated with corrosion. Therefore, if the soil resistance can be approximately measured, approximate calculations of the current flow can be made.

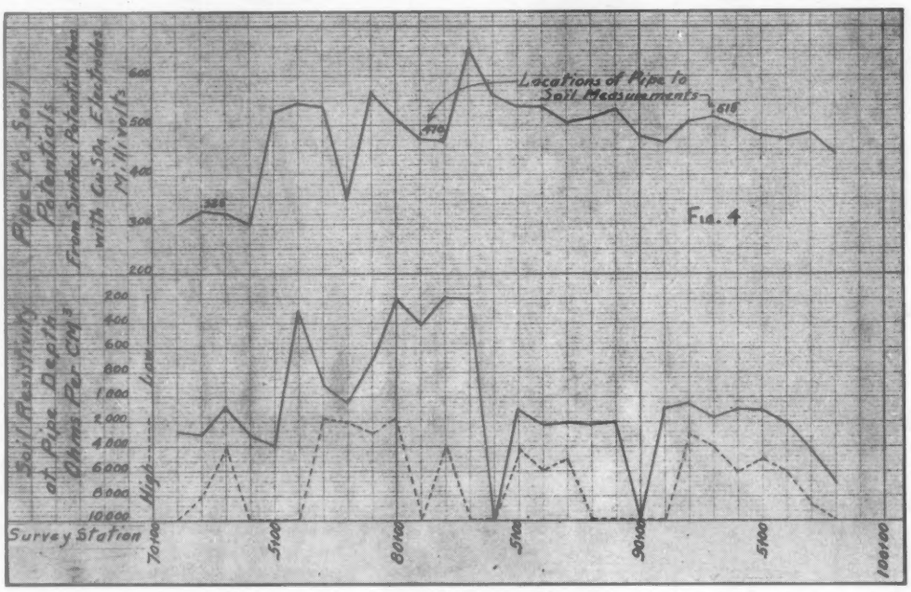
Soil Resistance

The actual resistance of soil circuits are difficult to measure; however, the greater part of the effective resistance in such a circuit occurs within 2 or 3 ft. of the pipe, so that soil resistivity measurements at intervals along the line to a depth exceeding that of the pipe will give data necessary to compute approximately the circuit resistance. ("Resistivity" is the resistance of a unit cube of material, whereas the term "resistance" as used herein refers to the resistance of the entire circuit.)

Soil resistance is governed by the amount of soluble chemicals present, i.e., soils with high chemical concentrations have low resistance, and vice versa. Soil resistivity measurements permit estimation of current path resistance and the probability of line corrosion. With a given voltage, it is evident that more current will flow through low resistivity soil than through soil of high resistivity. Low resistivity soil invites corrosion, since an abundance of chemicals are available to combine with the iron, and when adjacent to high resistivity soil, establishes conditions for battery action. It is desirable, therefore, to note the extremes of resistivity along the route.

Surveying for Corrosion

The amount of detail desired in a pipe-line survey will determine the intervals for surface potential and soil resistivity measurements; however, a practical program is to take millivoltmeter readings between consecutive surface contacts at 100-ft. intervals, and four soil-resistivity measurements between each surface contact. More than one corroding spot may exist within a 100-ft. section, in fact isolated corrosion cells have been detected within a 10-ft. length of 10-in. pipe line; however, observations at 100-ft. intervals will indicate the general corrosion activity along the line, and indicated corrosion sections can then be measured at shorter intervals.


Pipe-To-Soil Potentials From Surface Electrodes with Cu-Sa. Electrodes Millivolts
Soil Resistivity at Pipe Depth Ohms Per Cm³
Locations of Pipe to Soil Measurements
Survey Station
Low
High
Fig. 4

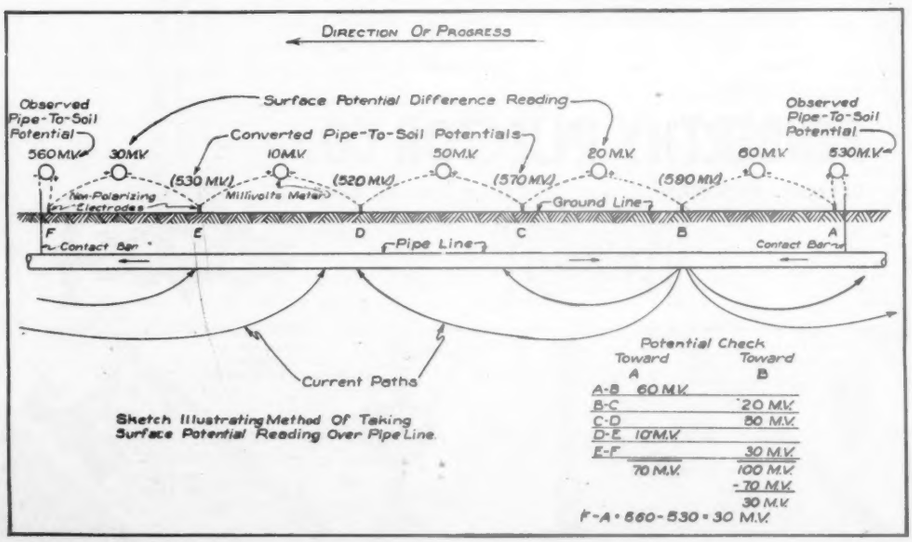


Fig. 3

To make a surface potential survey, first observe the pipe-to-soil potential (see Fig. 3), i.e., that between a metal bar in contact with the pipe and a nonpolarizing electrode placed in the soil over the pipe axis at the starting point *A*. Then place a second nonpolarizing electrode *B* over the pipe axis at the desired interval and observe the voltage drop between the two electrodes, also the polarity with reference to the geographical direction of progress.

The point of *positive* polarity will indicate the higher pipe-to-soil potential, and vice versa, with a difference equal to that between the electrodes.

Next, move the first contacting electrode an equal distance ahead of the second position, e.g., to *C*, maintaining the same relative position over

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the pipe axis and taking similar readings. Continue the procedure until 10 or 15 observations have been made. Then contact the pipe again with a metal bar, as at *F*, and again measure the pipe-to-soil potential with the contacting electrode remaining at the last location (*F*). The difference between the initial and final pipe-to-soil potentials should then equal the algebraic sum of the respective surface voltage drops of opposite directions. See the "Potential Check" in Fig. 3.

In the example the pipe-to-soil potential at *F* exceeds that at *A* by the difference between the larger sum of surface voltage drops (indicating soil current flows toward *F*) and the smaller sum of surface voltages drops (indicating soil current flows toward *A*). Continue the survey by repetition of the outlined procedure.

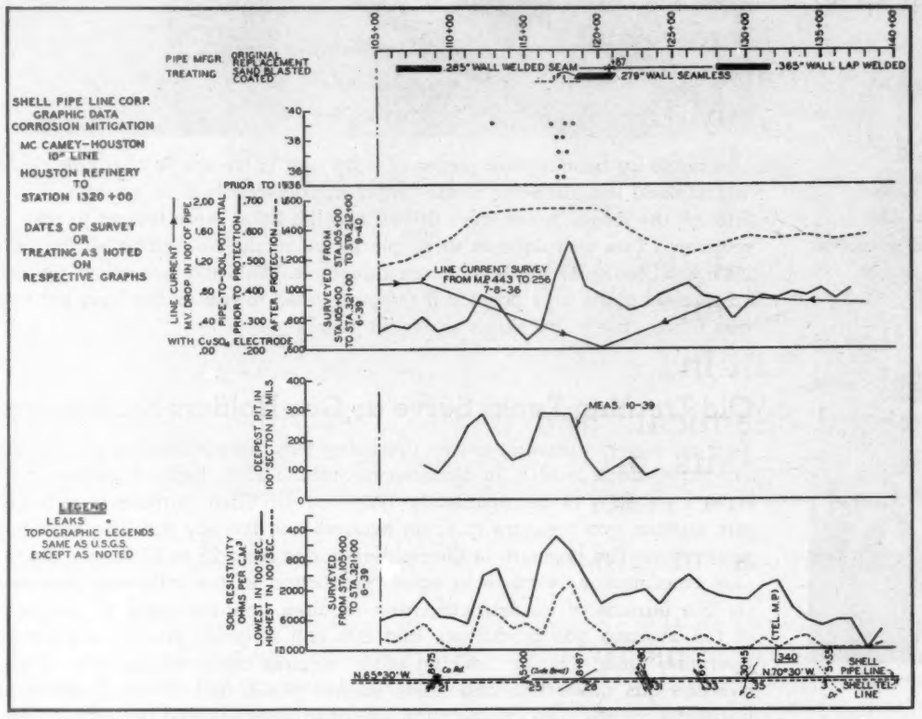


Fig. 5

Soil-resistivity measurements can be made with any suitable equipment; however, it has been found practical to use "Shepard Canes" or a "Soil Resistivity Megger." Shepard Cane readings may be expedited by prodding two holes through the backfill to depths of 3 or 4 in. below the pipe with a bar having a tip which is shaped like the Cane anode. The electrodes for the Megger must be placed so that the inner ones are equidistant from and perpendicular to the line.

Sources of Error in Measurements

Nonpolarizing electrodes develop differences of potential when in use, and these differences increase if one electrode tip is partially dried. Exhaustion of chemical crystals in the electrode also will increase errors. Four or five millivolts difference will vary with successive contacts. This error can be minimized, however, by moving the trail electrode to the lead position during alternate measurements. Electrodes should be placed in contact with moist soil. This may require the addition of water at times. The electrodes should not be touched with the hand while the meter is being read.

Repetition of a survey over a section of line will assist in discovering errors. A difference of 10 to 15 millivolts more or less between the algebraic sum of 10 or 15 intermediate readings and the difference between the successive pipe-to-soil readings does not constitute a serious error, since this is an average error of only 1 millivolt per reading. Such errors can be distributed in plotting.

As already pointed out, surface voltage drops measured along a line which is affected by electric energy originating elsewhere are of little or no value in detecting corrosion. Magnetic storms induce currents in pipe line that vary during the period of the storm. Such storms are easily detected during a survey by failure of the added voltage drop readings to agree with the pipe-to-soil potentials and by observing a variation of voltage between two electrodes over a period of 5 to 10 minutes. A recording millivoltmeter connected to the pipe line for measurement of current by voltage drop will record the start, duration and cessation of such disturbances.

Cathodic protection units within 3 or 4 miles of the surveyed section will alter surface potentials to such an extent that efforts are detectable for 4 days after such units are disconnected. Operation of soil resistivity instruments affects voltage drop readings up to 300 ft.; however, the effect is only for the duration of the meter's operation.

Multiple Line Surveys

Surface voltage drops measured over one of a group of pipe lines, preferably the one nearest the center, will indicate the general corrosion activity for the group. More detail may be obtained by placing an electrode directly over one line and another in turn over each of the other lines to determine their relative potentials. The line over which the highest positive potential exists is the one suffering the most corrosion at the time of observation.

Surface potentials converted to pipe-to-soil potentials, as illustrated in Fig. 3, together with corresponding low and high soil resistivity measurements, can be plotted graphically with respect to distance along the line to obtain a fair indication of the probable corrosion activity. (See Fig. 4). Such a record of a line that has been in service for some time can be verified by marking the location of leaks that have occurred. Fig. 5 illustrates a graphic record that contains much information regarding corrosion along pipe lines, including data on corrosion mitigation measures.

In practice, a crew of six men have surveyed an average of 3 miles per day of 10-in. line with 100-ft. intervals between surface contact points. This included four soil-resistivity measurements within each interval. The soil was above average in moisture content during the survey, which may have increased the speed with which the resistivity contact holes could be driven.

Conclusions

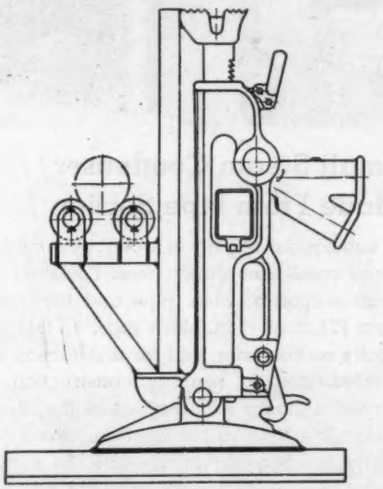
Potential differences or voltage drops observed between intervals on the ground surface above a buried pipe line are predominantly caused by corrosion of the pipe. This excludes areas where stray currents from outside sources are prevalent.

Measurements of these voltages and soil resistivity adjacent to the pipe provide a means for estimating the metal reduction. Such measurements are not infallible, but experience over 3 years prompts the author to conclude that the technique is in improvement over methods previously used because: (1) Anodic sections can be located within closer limits, and (2) more detail concerning electrolysis conditions along the pipe line can be determined within a given time.

●

Easy to Change Ordinary Jack Into a Reel Jack

AN ingenious warehouseman of a Texas company evolved the simple adaptation (see sketch) of an ordinary Model 310 Simplex jack which is being successfully used in the company's warehouse for spooling and unspooling wire rope.

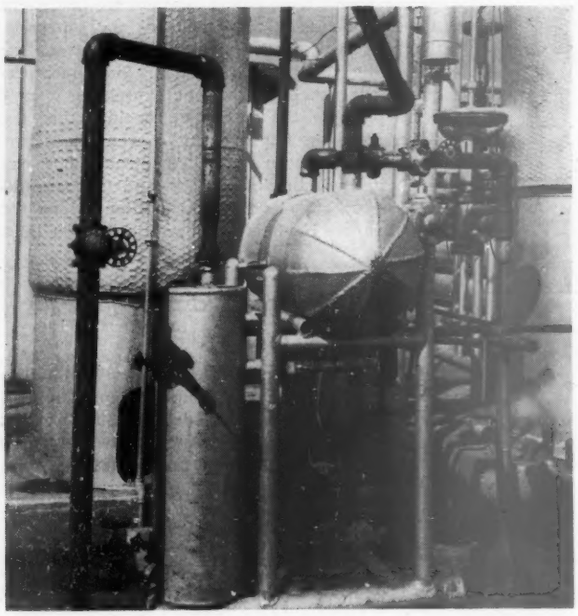


A 1 by 1-in. steel bar has been welded to the toe lift of the jack. This carries a bracket extension which in turn supports two rollers which carry the 3-in. pipe spindle. The bracket extension is about 6 in. and was necessary because the toe of the jack was not long enough to accommodate the rollers or size of pipe spindle necessary for large cable reels. It was also necessary to weld an extension to the base of the jack because the center of gravity had been shifted forward. Without it, pulling the cable from the reel would cause the jack to topple over.

The spindle is provided with a flange which in practice keeps the side of the reel opposite a fraction of an inch higher. This keeps the reel properly centralized when unspooling cable. Small flanges or collars are also provided for both sides of the rollers. Without these flanges the reel, unless absolutely level, would drift to the lower side and come in contact with the jack, preventing turning.

Refinery IDEAS

. . . that save $ $ $

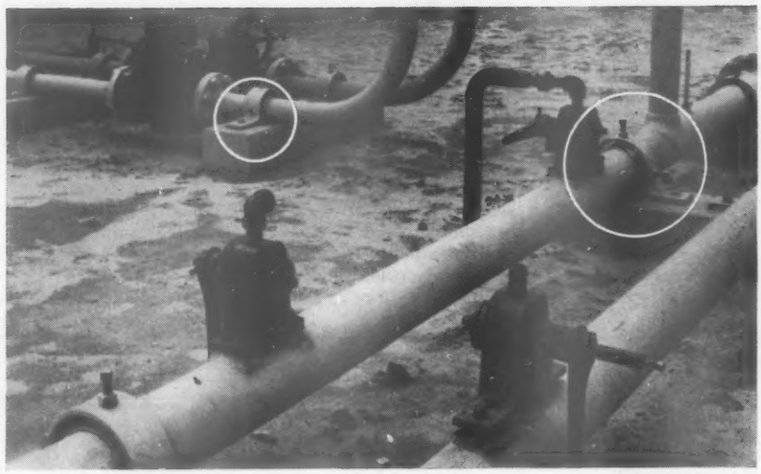


Small Steam Condenser Made From Pipe Section

A substantial saving in water was made possible by the small condenser shown here. The shell was made from a short section of 26-in. pipe and the coils were made up from 121 ft. of ½-in. black pipe. In this case there is practically no corrosion and for that reason the shell could be welded shut to simplify construction. This condenser serves a steam still and takes the steam from the still coils. The bulk of the heat contained in the steam originally is absorbed in the still but sufficient heat sometimes remain in the steam to hold it in the vapor form and under these conditions the condenser has proved especially valuable. The hot condensate from the unit goes to the boiler makeup water sump.

Adjustable Holddowns on High-Pressure Line

Processing gas at abnormally high pressures presents a problem of properly anchoring the lines so that a minimum of strain be placed on their free movement due to inaccurate alignment when installing and shifting of alignment of bases. In ordinary plant operations the shifting of bases is slight and the strain placed on the pipe as a result is readily absorbed by the pipe itself but this practice is too dangerous where large volumes of high-pressure gas are involved. So, here the construction designed called for an adjustable holddown. This



was made by bending two pieces of strap iron in the shape of a half circle and making the diameter of the larger approximately 2 in. greater. Then through the larger, holes were drilled and the holes were tapped to take a setscrew. This was done at three places along the half circle so that adjustments could be made in three directions. This did not allow for the adjustment of the pipe position if the pipe failed to rest on the base but this was taken care of by shims under the clamp.

Old Treating Tanks Serve as Gas Holders For Burners

Two old gasoline-treating towers are being used as gas holders at a cracking plant. Each is 16 ft. in diameter and about 25 ft. high. Together, they have a capacity of approximately 10,000 cu. ft. Their purpose is to maintain uniform gas pressure at firing headers and thereby stabilize cracking operations. The pressure in the holders varies from 25 to 65 lb. per sq. in. Gas consumption is made to equal production in the following manner: (1) The furnace at an extraction unit requires approximately 20 per cent of the average gas production, and this unit is given priority over other operating units; (2) the cracking plant requires about 60 per cent of the average gas production and holds second place, and (3) the crude unit burns the excess. The crude still is equipped with gas and fuel-oil burners, and the quantity of gas burned is regulated by the fireman in accordance with a pressure shown on the gas holders. This pressure reading is transmitted to the crude unit fireman over a distance of 1,000 ft. and by lines filled with kerosene. The gage glass in the line at the terminus of the kerosene line is shown in the picture at the right.

"Job Analysis"

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International Dealer Service stands back of every International TracTracTor—to help keep them working. The TD-14 Diesel above, owned by A. D. McAlister, Wichita Falls, Tex., is digging a slush pit.

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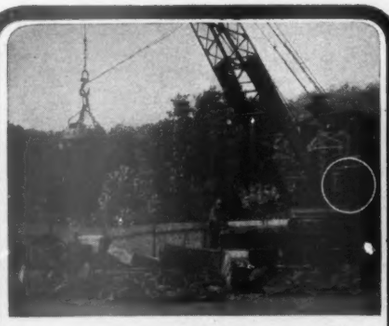


GET IN THE SCRAP!

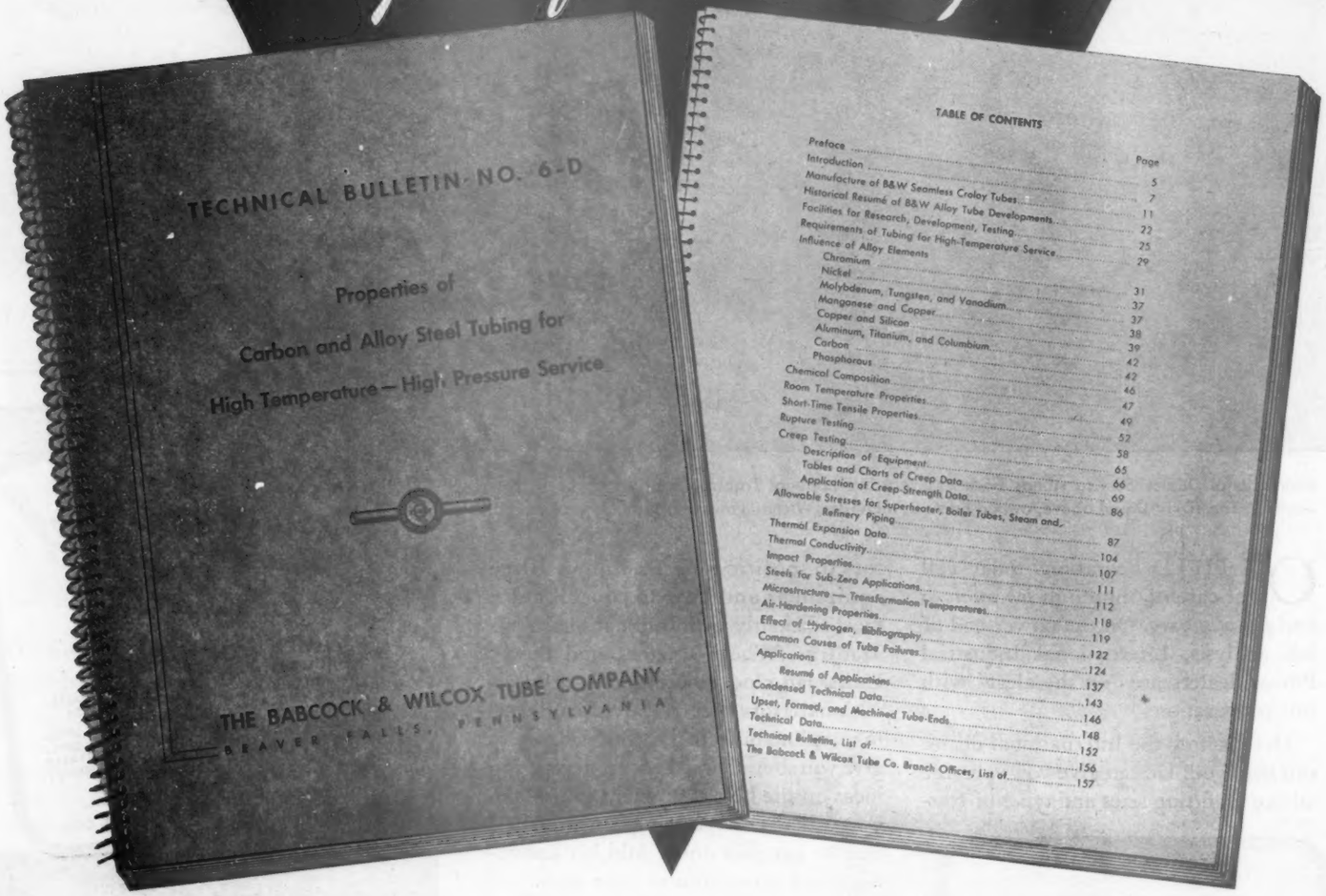
Scrap iron and steel is on the march to the mills. Soon it will be *tanks* and *guns, ships* and *bombers!* Here an International U-2 Power Unit is speeding the salvage drive—generating power for control of the magnet—at a metal products plant.

International TD-9 TracTracTor, one of four Diesel TracTracTors owned by Healey Petroleum Corp., Bradford, Pa., putting a new rig in place in the Bradford field. ►

WHAT EVERY ENGINEER WANTS TO KNOW

ABOUT HIGH TEMPERATURE—HIGH PRESSURE STEEL TUBING: ALL IN THIS NEW BOOK

Yours for the asking


TECHNICAL BULLETIN NO. 6-D
Properties of
Carbon and Alloy Steel Tubing for
High Temperature—High Pressure Service
THE BABCOCK & WILCOX TUBE COMPANY
BEAVER FALLS, PENNSYLVANIA
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NEW B&W TECHNICAL BULLETIN NO. 6-D

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TA-1194

BABCOCK & WILCOX TUBES

HOT FINISHED COLD DRAWN ALLOY STEELS CARBON STEELS

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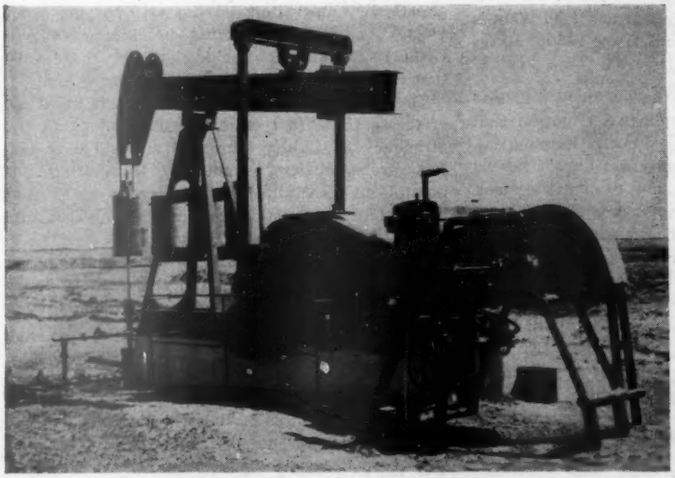
Operating Ideas

Centralized Mud-Pressure Blowout Control

Use of slush-pump pressures for closing the rams of the blowout preventer in an emergency requires adequate pressure on the mud stream to effect closure. One drilling contractor on the Gulf Coast follows the practice of tying in the mud line to the preventer in line with the standpipe mud-pressure gage. This simplifies the connections and puts the control valve where it can be reached easily. The connection to the right is for cementing, or for connecting a high-pressure pump.



Pumping Unit Runs Pipe-Line Pump

Saving the installation and operation of a separate engine for the purpose, the producer of a five-well lease in an Oklahoma field operates the lease gathering-line pump with the engine of one of the pumping units. The engine has an auxiliary pulley wheel with a belt drive to the pump. To disconnect the centrifugal pipeline pump the belt is removed from the pulleys.

Metal Sheet Keeps Oil Off Engines

When bailing a well with a reel mounted on the draw works, oil on the bailing line splatters over the engines, creating a fire hazard as well as causing a messy condition to clean. To avoid this, the crew on the rig shown in the accompanying picture has fastened a sheet of old galvanized iron to the back of the derrick above the bailing line reel preventing oil from splattering back on the engines. Note also that the drilling line has been removed from the hoist below to keep the oil from dropping on it, a practice not generally followed.

Hard-Facing Applied to Tool Joints

Life of tool joints prolonged by hard facing applied circumferentially on pins and boxes just above face. This prevents distortion of boxes which are becoming too thin for further use. Care must be taken when applying hard facing to the box to prevent its being warped. Joint must be refaced before putting back in service. This method allows the tongs to grip on original tool-joint body where they can obtain a firm bite.

QUESTIONS ON TECHNOLOGY

W. L. NELSON

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to W. L. Nelson, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists, and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible. Inquiries must be signed but only the given initials will be printed. The source of the question is considered to be confidential.

Questions requiring a discussion of patents, extended computations, or a detailed study cannot be considered. When the matter is of general interest, a reply will be published within a reasonable time.

Hazards of Butane for Drilling Engines

We are confronted with inquiries from our insurance companies concerning the hazards of butane gas when used from tanks in the drilling of oil wells. The many advantages of butane are evident but we must know the disadvantages or hazards which result by its use. —G. O. B.

The only extensive use for butane in drilling or field work is as a fuel for internal-combustion engines, although to a very limited extent bottled gas (mainly propane) is being used for oxygen-gas cutting of steel. The latter service is covered adequately by Pamphlet 51 of the National Board of Fire Underwriters, 85 John St., New York, or 222 West Adams St., Chicago. This pamphlet pertains to the operation and installation of gas systems for welding and cutting.

The main use, i.e., as an engine fuel, is also covered by the National Board of Fire Underwriters in their Pamphlet 58 entitled "Liquefied Petroleum Gases." Drilling utilizations are not specifically mentioned in this pamphlet but the rules and regulations given therein are directly applicable to drilling-rig service, particularly Division 4, which applies to the use of butane as a fuel for self-propelled internal-combustion engines. In drilling work, the butane is taken from a high-pressure aboveground storage tank through a heat exchanger (or vaporizer) and expanded into a substantially atmospheric-pressure gas which is sucked into a carburetor system similar to that used on automobile engines. The installation is fully automatic so that the regulator valve does not open and release butane gas until speedup of the engine calls for more butane.

Although the general hazards are emphasized in the N.B.F.U. pamphlets there are certain differences in oil-field service that might be mentioned. The butane tank and lines will be in close proximity to heavy field equipment which might in case of accident, break or fall on the gas system. This would call for somewhat heavier vessels, lines and fittings at exposed parts of the system. In oil-drilling service, the installation is temporary and this might lead to carelessness. The butane tank is larger in oil-field installations and it is usually set aboveground. The tank should be painted white or with aluminum paint, and in field work the tendency would be to permit the tank to become dirty and discolored. The tank should not be located with respect to the drilling rig in such a location that the heavy vapors of butane could accumulate at a low place surrounding the rig. Finally, the butane system would be readily accessible for tampering or sabotage.

The general installation and care required in handling butane gas and the general characteristics of butane have been discussed extensively and hence these will not be discussed here. General discussions of this nature are (1) Heiss, H. A., Causes, Prevention and Control of Fires on Light Liquid Hydrocarbons, The Oil and Gas Journal, March 28, 1940, Page 135; (2) Wells, N. C., Safety Methods and Appliances in Gasoline-Plant Operations, Refiner & Natural Gasoline Manufacturer, August 1935, Page 389; and (3) Howell, J. T., Causes, Prevention and Control of Petroleum Fires, The Oil and Gas Journal, December 23, 1937, Page 33. Other useful references are "Petroleum Standards of Liquefied-Petroleum-Gas Industry," The Oil and Gas Journal, August 14, 1941, Page 49, by G. L. Brennan; and the two publications by W. S. Topping, entitled "Freight Tariff No. 4-I.C.C. Regulations (Bureau of Explosives, 30 Vesey Street, New York) and Motor Carrier Tariff No. 5-I.C.C. Motor Carrier Safety Regulations.

Amount of Excess Air For Maximum Efficiency

A technical handbook says that for maximum thermal efficiency, the excess air should be greater at high capacity than at low capacity, also that the capacity at maximum thermal efficiency is less than the capacity at which a boiler should be operated for maximum commercial efficiency. With present restrictions on new materials, we are interested in doing all that we can to conserve equipment and fuel. What is the general practice with regard to the use of excess air?—A. W. N.

It should be indicated at the outset of a discussion of this extremely complicated situation that a high thermal efficiency may not be economical. In order to obtain a thermal efficiency of say 90 per cent, it would be necessary to cool the stack gases to an inlet-stack temperature of less than 500° F., even if no excess air were used, or down to about 300° F. if 100 per cent excess air were used. (These figures are based on the net heating value and were taken from Page 182 of Petroleum Refinery Engineering, McGraw-Hill Book Co., New York.) Obviously such stack temperatures could not be attained in most petroleum stills because the inlet-oil temperature is usually 300°-500° F., and because literally thousands of feet of additional heating surface would have to be added to the convection sections of most of the pipe stills now in operation. This reason alone accounts for the fact that petroleum stills are usually designed for a thermal efficiency (based on the net heating value) of 70-75 per cent (Petroleum Refinery Engineering, Page 659) whereas boilers may operate economically at 82-88 per cent efficiency. Thus, the cost of pipe stills mounts rapidly as efficiencies past 75 per cent are attained. All of this is pointed out for the specific purpose of indicating that thermal efficiency is a measure of economy only with respect to the amount of fuel required.

In the operation of an already completed equipment there is a most economical set of operating conditions for each capacity, but to a large degree this optimum condition of operation must be determined by experiments with the equipment in the plant, because it is related to many individual factors such as burner design, type of fuel, arrangement of heating surface, shape or amount of furnace cavity, stability of the stock being heated, etc. Only most general information can be given about these vague factors because they are interrelated and are tied to the details of each still.

In a general way, *increased capacity* requires both more fuel and more air but usually requires more than a proportional increase in excess air due to the tendency to overheat the radiant surfaces or to crack or decompose the stock in the radiant section. This decreases the thermal efficiency and may in extreme cases result in unsatisfactory operation of the still, or in other words, the capacity cannot be increased, particularly for lube or cracking stills or those stills that contain a small amount of radiant surface.

The use of *less excess air* has much the same effect as those just enumerated, except that the efficiency is slightly increased and all of the effects are much less pronounced. In addition it is possible to greatly decrease the excess air so that incomplete combustion occurs causing a rapid decrease in thermal efficiency.

In general, in proceeding from a very low capacity to high capacities, the thermal efficiency at first increases and then decreases, and in going from a high percentage of excess air to a low percentage of excess air at a fixed capacity, the efficiency first increases and then decreases, the exact positions of maximum efficiency being dependent on details of the still construction, the adjustment that is possible with the burners, and the thermal sensitivity of the charge stock. It should also be noted that the stack will not draw properly at very high efficiencies because of the low-stack temperature. Finally any practice which may cause slow but eventual damage to the equipment will affect the economy. Thus, too high furnace temperatures may cause undue high temperature oxidation or rusting of the tubes and supports, or too low a stack temperature may result in the condensation of water in the stack and its rapid destruction by corrosion.

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ENGINE BUILDERS SINCE 1833

Testing of High-Pressure Gases

By C. H. GEE
La Gloria Corp.

IN making this report it seems to me some historical data should precede the account of recent comparative gas tests along the Gulf Coast in order that the succession of events leading up to the work will be clear.

About a year ago the N.G.A.A. gas-testing committee extended its studies to include high-pressure gases and began to plan a rather extensive program of research on several pressing problems in distillate operations. Much of this work was a natural corollary to previous work on low-pressure gases where standard test methods for determining content, specific gravity, sulfur, volume, etc., had been established.

Among the problems which were considered of primary importance in the high-pressure gas studies were:

1. Development of standard methods for sampling and testing of gases.
2. Development of standard methods of high-pressure gas measurement.
3. Study of high-pressure gas transmission.
4. Study of subsurface flow conditions.
5. Development of methods for removing salt and hydrogen from gases.
6. Study of liquid entrainment in high-pressure gas streams.
7. Development of a standard method for determining specific gravity of raw gases.

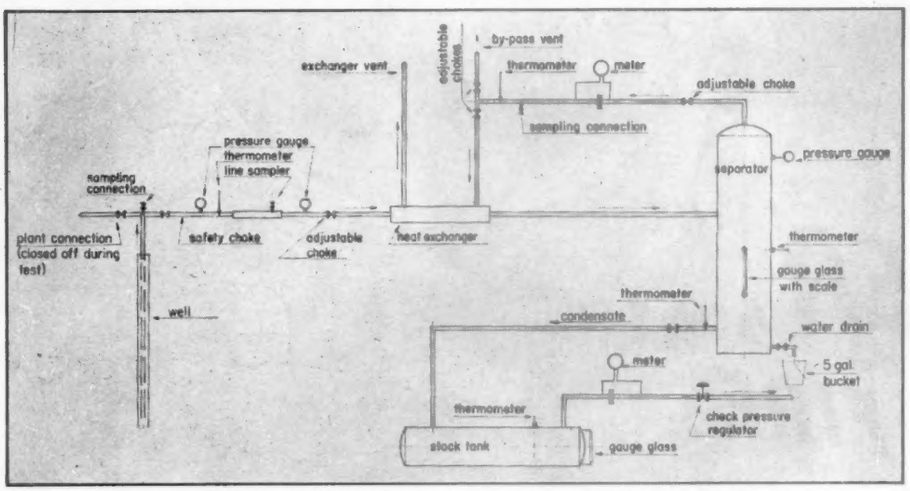
Since it was conceded very little progress could be made on the whole project until the answers to the first two problems were obtained, it was deemed necessary to make a survey of all methods then in use for obtaining a representative sample from a high-pressure distillate well and the methods used for determining the liquid content of the gases. Accordingly, H. L. Oder, Cities Service Oil Co., chairman of the committee, was assigned the job of making this survey at association expense and his voluminous report is a fine testimonial to his ability and thoroughness. He spent 5 weeks touring the distillate fields of Texas and Louisiana and talking with technical men and operators. His very complete report was used for planning a direct attack on the problems.

At about this same time, the American Recycling Association, under the leadership of E. E. DeBack, Corpus Christi Corp., and Prof. R. L. Peurifoy, Texas A. & I. College, was planning much the same type of program. Last fall discussions between executives of that new organization and those of the N.G.A.A. brought about a consolidation of the two groups and resulted in the formation of the high-pressure gas division of the N.G.A.A. At special meetings in Houston and Dallas, the representatives of the division laid the plans for beginning the program right after the first of the year. The unfortunate death of Mr. DeBack and changes in personnel brought about by the war delayed the program, however, and it was not until March of this year that plans for field testing were actually completed.

In the meantime, the divisional technical committee, under the chairmanship of E. O. Bennett, Continental Oil Co., had decided the best approach to the problem of supercompressibility factors and orifice meter measurement of high-pressure gases was to hire the best available talent to correlate all existing data on the subject and present a recommendation for standardization. The committee discussed the problem with Dr. D. L. Katz, University of Michigan, who agreed to undertake the study providing member companies would make available for his use certain field data required to substantiate his theoretical determinations. These arrangements were satisfactorily completed and the first report on this phase of the project is to be presented at this convention by Dr. Katz.

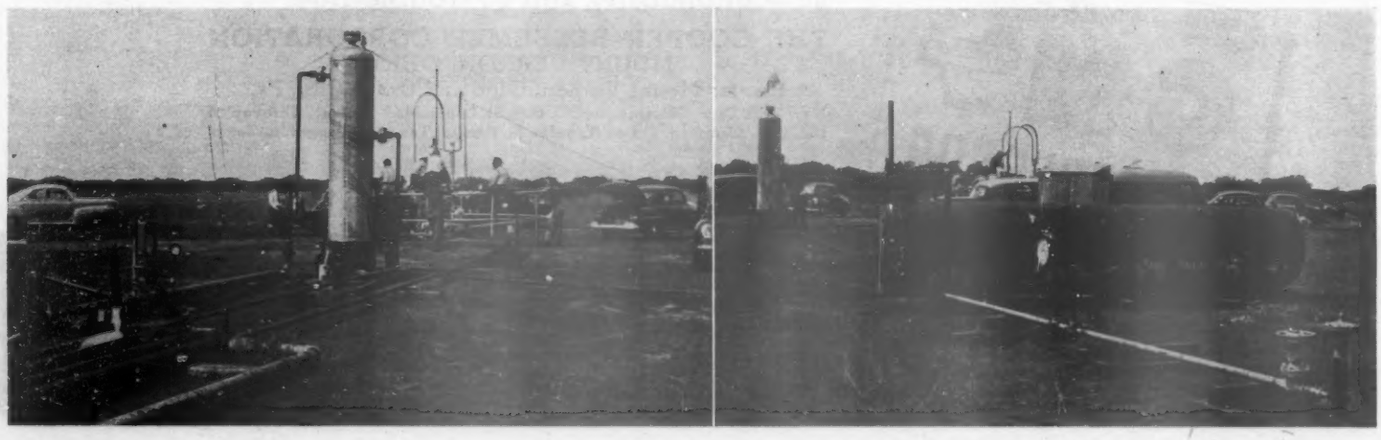
Returning now to the recent field tests. The purpose of the work was to complete the results obtained by the several different and widely used devices for obtaining a representative sample of gas from a distillate well when all were testing the same gas from the same well under identical conditions. All results were then to be compared with those obtained by full scale separation in a high-pressure separator. The whole program calls for a repetition of the series in several areas on gases of varying content and at different pressures. The recently completed field comparisons are but the first in a planned series of four in the Gulf Coast region.

The actual field equipment was arranged and mostly strong-armed by Herald Oder. He was ably assisted by J. M. Stanford, James Grimshaw and W. R. Brown, of the Chicago Corp., and J. C. Birdsall, Lockhart Petroleum Corp., and the committee is highly appreciative of their efforts. The equipment was so laid out as to permit testing by

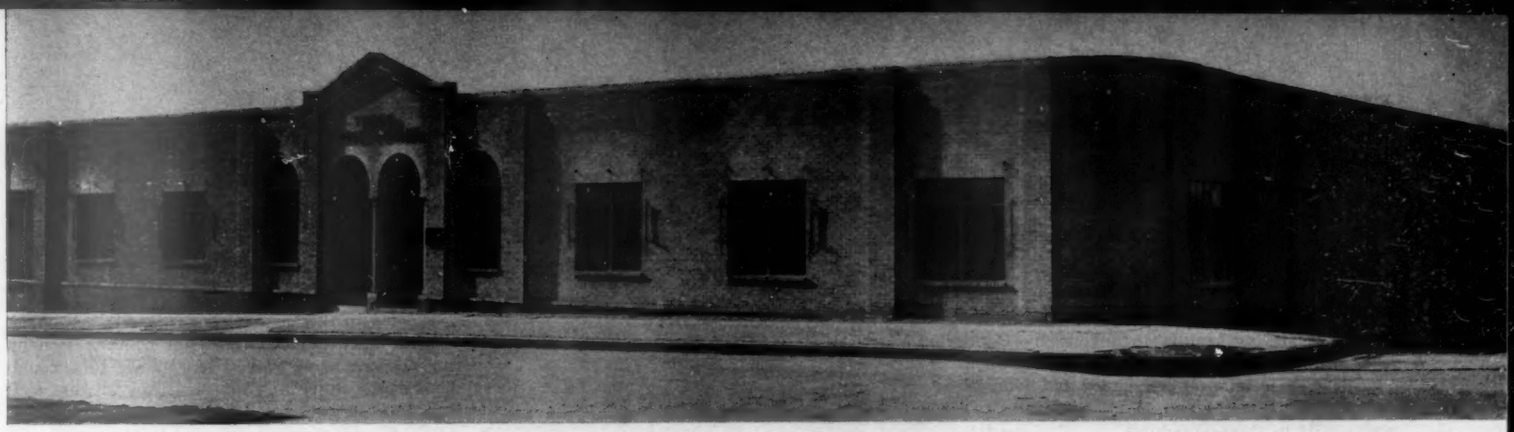


Flow diagram of testing equipment of 9 Wardner well

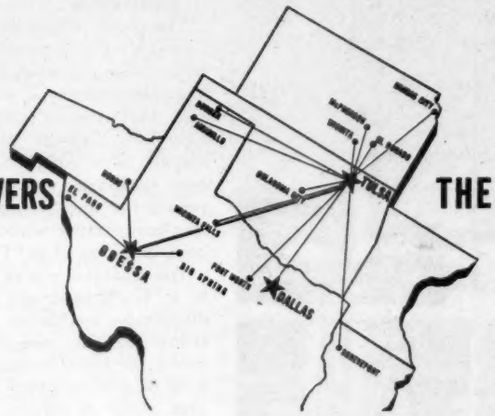
Left: General view of equipment with heat exchanger, gravity-balance and meter setting at left, separator and well at rear. Stock tank is off right. Right: Stock tank with meter setting and pressure control



Presented at the twenty-first annual convention, Natural Gasoline Association of America, May 14-15, Tulsa.



SERVICE THAT COVERS



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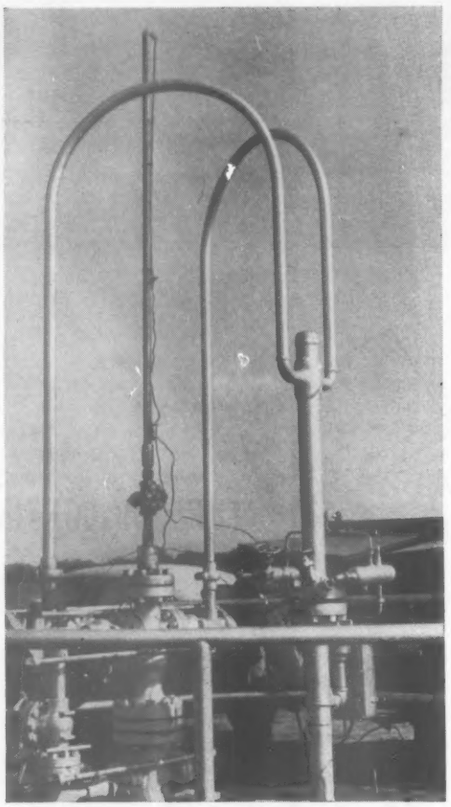
all the various types of testing devices. Every company and laboratory having such equipment was invited to participate in the work. Each was notified as to the dates of the series, April 13 to 17, and the place, the 9 Wardner well of the Chicago Corp., near Kingsville, Tex. Each was requested to make tests with standard equipment without revealing results to anyone by Herald Oder, who was in complete charge of the series. The devices of four oil companies and four laboratories were tested and 14 oil companies took active part in the proceedings.

The association in general and the divisional technical committee in particular wishes to give its official thanks at this time to the testing laboratories and supply companies for their much appreciated and valuable cooperation in this test series. Without the assistance of Henderson Engineering Laboratories, Alice, Tex.; Parks Laboratories, Inc., Houston; and E. W. Saybolt & Co., Houston, the research program would not have been possible. Messrs. Henderson, Parks and Sandberg, respective representatives of these companies, gave unstintingly of their time and counsel. Our special thanks are due to G. O. Kimmell and to his company, Black, Sivalls & Bryson, the former for his valuable advice on general procedure and his personal assistance at the well and to the latter for its generous loan of some of the principal parts of the equipment set up at the well. Other supply houses which loaned equipment were Refinery Supply Co. and Westcott & Greis, Inc.

Dr. Frank Dotterweich, Texas A. & I., Kingsville, and Dr. Sidney Born, Tulsa University, also supplied valuable advice and equipment for which the committee was very grateful.

Specifically the equipment at the well was as follows: The 9 Wardner had the customary type of christmas tree found on many condensate wells, two wing valves off the tubing connection with the casing connected to one side. However, the well was normally produced only through the tubing. The well was already equipped for the introduction of a sampling nozzle into the tubing.

Connections from one side of the tubing to the meter were removed and this side was prepared for connection to the full-stream testing apparatus as follows:



Christmas tree arrangement with tubing sampling device in operation

1. A safety choke was installed large enough to offer only a minimum resistance to ordinary flowing rates but which would prevent the well from "going wild" should a line break occur.
2. A nipple containing a pressure-gage connection and a thermometer well.
3. Provision for a flow-line sampling device.
4. Another pressure-gage connection. This gage together with the one in the (2) above would determine the drop across the sampling device in (3) above.
5. An adjustable choke, the setting of which determined the producing rate of the expanding gas going to the separator.

With this arrangement of piping, and by switching the two wing valves, the tubing flow could be turned either to the plant or to the test apparatus as desired. Such an arrangement is quite important as it permits flowing the well continuously and thus avoids the troublesome delays of waiting for a previously shut-in well to stabilize itself.

The partly expanded gas then flowed through one side of a heat exchanger to the separator, which was operated at about 900 lb. pressure. Two suggestions as to the best operating pressure were received: one was for 800 lb., and the other for 1,000 lb. Nine hundred pounds was chosen as a compromise between the two. A heat exchanger was provided to lower the temperature of the flowing gas in the separator since this temperature without exchanger would have been in excess of 90° F .

The separator was of 1,000-lb. pressure capacity, 30 in. in diameter and 13 ft. high. The float and dump-valve mechanism was removed and the separator carefully measured by liquid volume between the levels indicated by two marks on the ends of a scale which had been cemented to the gage glass. A narrow strip of mirror was also cemented to the gage glass to help avoid the effect of parallax in reading the liquid level. By timing the producing interval between the lower and upper marking on the scale an accurate rate of liquid production could be determined.

Determining Separator Pressure

A thermometer in a well on a level with the top gage glass connection was used to determine the gas temperature, and another thermometer in a well in the liquid outlet gave the temperature of the condensate. Separator pressure could be determined from an indicating pressure gage and also from a recording gage.

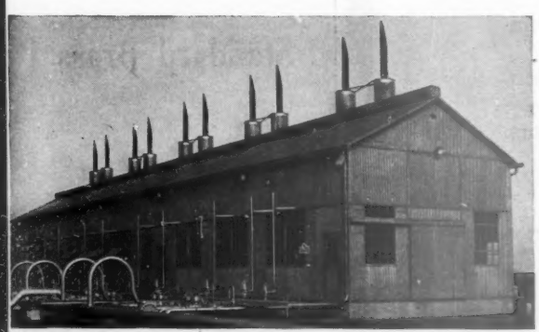
Condensate was throttled from the separator to the stock tank through a ¼-in. needle valve. A 1-in. shutoff was provided ahead of the ¼-in. valve so that the latter might be removed for cleaning, if any obstruction occurred. Water produced was drained from the separator through a similar arrangement of valves into a 5-gal. cylindrical bucket. A cylindrical bucket facilitated water measurement, which was done by gaging the depth with a rule. The separator gage glass was arranged to secure condensate samples at separator pressure.

The stripped gas passed from the separator through an adjustable choke, set to hold the desired separator pressure, and expanded through a 4-in. line (3.816-in. i.d.) high-pressure meter setting where it was measured. Adjustable chokes on the meter outlet maintained about 400 lb. pressure on the meter. Four hundred pounds pressure for the meter measurement was chosen as a compromise, since gas measured at the separator pressure—900 lb.—would have introduced a large and questionable deviation factor, while measurement at near atmospheric pressure would have resulted in freezing temperatures in the setting. It also would have required a meter run of large diameter to measure the flow at low pressure.

Since high-pressure meter outlets expanding to atmospheric pressure may freeze off, such meter settings should be built to withstand the maximum separator pressure.

A thermometer well near the meter outlet was provided to determine measurement temperatures and a gas sampling connection was also located at this point.

You Can Build or Expand in a HURRY



Compressor building for Recycling Plant in Texas built by Allied Steel

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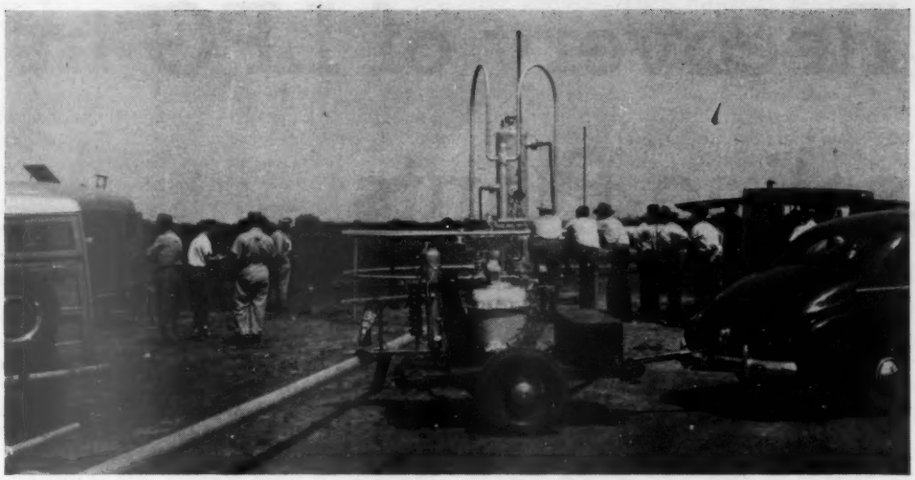

View of equipment at well showing test cars of Henderson Laboratories on left, Lone Star Gas Co. in center and Parks Laboratories on right

Gas flowing from the high-pressure meter setting divided and expanded through two adjustable chokes, one of which vented directly to the air, while the other expanded part of the stream through the low-pressure side of the heat exchanger. Proper regulation of these chokes controlled both the pressure in the meter and the temperature in the separator.

Separated condensate expanded to a 4 by 20-ft. horizontal stock tank where the net volume could be gaged. A deep thermometer well through the top of the tank to a point near the tank bottom provided means for securing condensate temperatures. The vapor vented to the air through a 2-in. meter setting with a check pressure regulator on the meter outlet.

Obviously, definite and final conclusions should not be drawn from a preliminary set of comparative tests, and this association will have made reasonable progress if it has learned how a second set of tests should be conducted. To avoid the possibility of erroneous conclusions being made at this time the results of the tests, pending further study, are reported in such a manner as not to identify the various testing devices.

In the following tabulation the arbitrary numbers, 1 to 7 inclusive, designate the results obtained by the various test devices. The letters "FS," meaning full stream, indicate the corresponding result of the full-stream apparatus. The ratios were determined by dividing the respective test results by the corresponding full-stream results—Ratio A, and the average of the latter results—Ratio B.

Test—	Net content	Ratio "A"	Ratio "B"
No. 1	0.602	1.095	1.095
F.S.	.550		
No. 2	.673	1.191	1.224
F.S.	.565		
No. 3	.555	.995	1.009
F.S.	.558		
No. 4	.636	1.156	1.156
F.S.	.550		
No. 5	.563	1.093	1.024
F.S.	.515		
No. 6	.527	.958	.958
F.S.	.550		
No. 7	.644	1.140	1.170
F.S.	.565		

The orifice-meter base factors used for calculating gas volumes measured by the high-pressure meter were furnished by American Meter Co., Erie, Pa. The base factors furnished by the Pittsburgh Equitable Meter Co. did not arrive until after the tests were completed. Pressure base, specific gravity, flowing temperature, Reynolds, expansion and deviation factors were all applied in the gas volume computations.

Specific gravities were determined by two balances as well as by a small portable indicator manufactured by the Permutit Co. While another design of this device has been used for some time for the measurement of CO_2 in other industries,

(Continued on Page 74)

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Increasing Recovery of LPG in Natural-Gasoline Plants

By J. W. WILSON
Cities Service Oil Co.

TOTAL sales of liquefied petroleum gases as such have increased on an annual basis from 221,641 gal. in 1922 to 313,456,000 gal. in 1940, and an estimated total of 445,000,000 gal. during the year 1941.[1]

The increasing number of uses to which the individual hydrocarbons in the liquefied petroleum gas range are being put, as well as the favorable reception of these gases as domestic and industrial fuels, is causing an accelerated demand which was especially noticeable in 1940 and 1941.

Since December 7, 1941, liquefied petroleum gases, particularly the butanes, have assumed a new and greater importance. Prior to the inception of the war program, only a small part of the natural-gasoline industry's products had been used in the manufacture of 100-octane aviation gasoline, and even less in the manufacture of synthetic rubber.[2]

The present program has been variously estimated at 200,000[3] bbl. or more per day of 100-octane aviation gasoline. In order to present some idea of the enormous volume of liquefied petroleum gases which will be required to produce this volume of aviation gasoline, the following figures based on the alkylation process are illustrative.

It has been reported that the alkylate required in the blend may vary from 15 to 60 per cent of the total, depending upon the characteristics of the other blending materials used. Assuming 45 per cent as an average figure, then for 200,000 bbl. of 100-octane gasoline approximately 90,000[4] bbl. of aviation alkylate will be required. It is reasonable to expect a yield of approximately 80 per cent based on a charging stock of butylene and isobutane in a ratio of 1 to 1.2. On these assumptions it would require about 52,000 bbl. of butylene and about 62,000 bbl. of isobutane to make 90,000 bbl. of aviation alkylate.[4] Part of the isobutane will be recovered from refinery tank vapors, part from stabilization of the primary cut from crude oil, part from the natural-gasoline industry, and the remainder from isomerization of normal butane. Furthermore, in order to obtain sufficient butylene, it will be necessary to convert some portion of normal butane by means of the catalytic and thermal processes.[5]

From published reports during the week of April 9, 1942,[6] it was noted that 14 oil-refining companies, representing 53.81 per cent of the nation's total crude-oil refining capacity, 7 chemical concerns, and 4 rubber manufacturers have accepted contracts with the federal Government to build and operate facilities for production of 700,000 tons of synthetic rubber annually.

For the manufacture of 700,000 tons of synthetic rubber per year, enormous quantities of butane will undoubtedly be required. In the case of Buna-S rubber, if we assume a 45 per cent by weight conversion of butane to rubber, then it would probably be necessary to produce as much as 700,000,000 gal. of butane per year for this purpose alone.[7,8] Of this total, approximately one-half, under some estimates, will be obtained from refinery gases, and the remainder from natural gasoline, recycling and repressuring plants.

In order to secure adequate supplies of the liquefied petroleum gases for the many purposes to which these gases are put, but particularly for the manufacture of aviation gasoline, Recommendation 25, Part 1512, was issued to the natural-gas and natural-gasoline industries by the Office of the Petroleum Coordinator for National Defense under date of January 26, 1942. Paragraphs 1512.3 of Recommendation 25 is quoted to wit:[9]

"Extraction and Production of Existing Plants to Be Increased.

"All persons, natural or artificial, presently owning or operating any natural-gasoline extraction plant, recycling plant, pressure-maintenance plant, or repressuring plant shall increase the percentage of butane and isobutane extracted from the gas processed at such plant, or plants, to the maximum quantity economically possible,

Presented before the twenty-first annual convention of the Natural Gasoline Association of America, May 14-15, 1942, Tulsa.

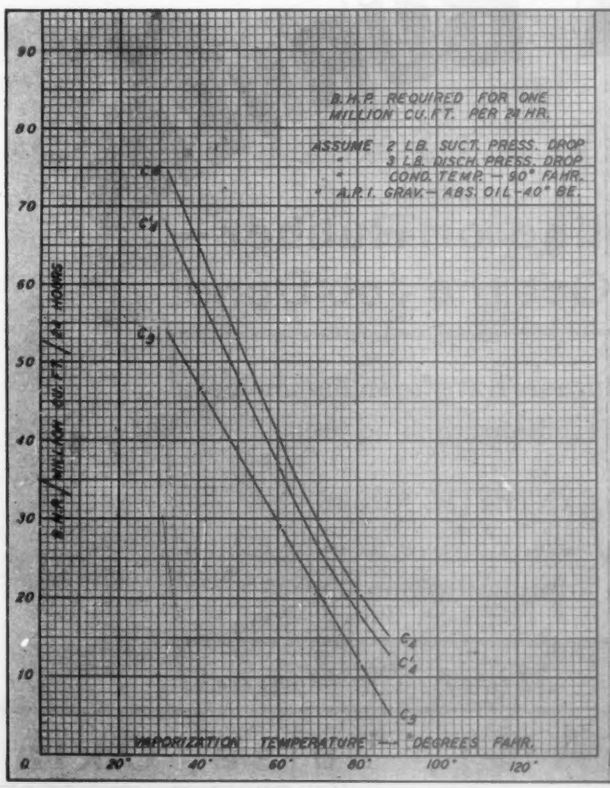


Fig. 1

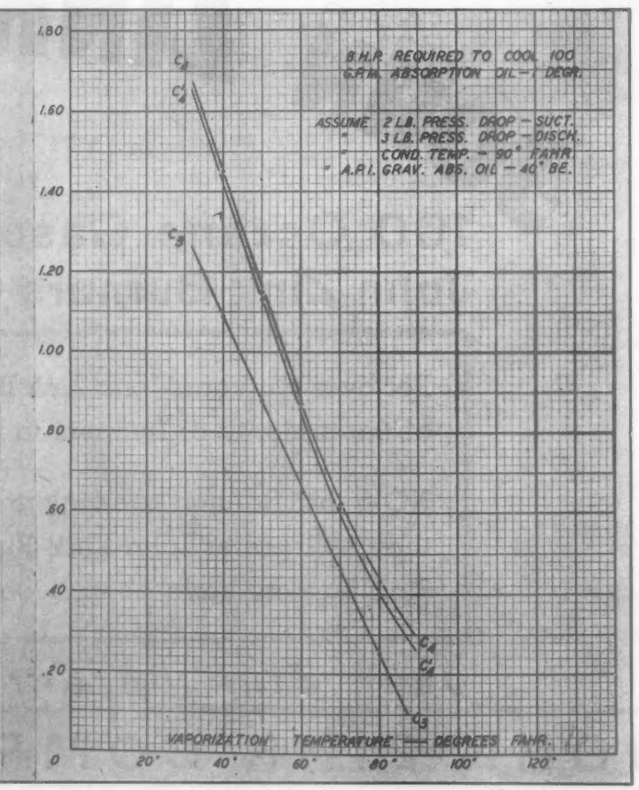


Fig. 2

and shall increase the production of butane and isobutane in liquid form at such plant, or plants, to the maximum quantity economically possible."

Since January 26, 1942, the synthetic-rubber program has reached a stage of equal or greater importance than the 100-octane aviation-gasoline program, and more recently, indications are that the rubber program may be extended to 1,000,000 tons annually and possibly more. Therefore, it is impossible to stress too strongly the magnitude of the problem facing the natural-gasoline industry in preparing itself for maximum participation in the war effort. This paper will be limited to suggestions of ways and means of increasing the extraction of liquefied petroleum gases with existing equipment only. No attempt will be made to present any fundamentally new ideas. Instead, certain practical methods, previously presented, or in use, by others will be reviewed briefly, and references given for further reading by those who care to do so.

1. Fundamental Analyses and Plant Balance

Unless sufficient recent data are on hand to accurately determine the present extraction efficiency of the plant, it is recommended that sufficient fundamental, or low-temperature distillation, analyses be made to obtain a plant balance. In any event, such analyses should be made on the inlet and outlet gases, and on any vapors being lost from the plant. Samples should be as nearly representative as possible of average normal operating conditions. If the composition of the input gas is continuously changing due to well operations or other causes, it would be advisable to obtain composite samples over a period of several hours, or even over a full 24-hour period.

From the analyses of the inlet and outlet gases, the absorber efficiency for such components under existing conditions can be calculated,[10] and a decision made as to what changes or additions are necessary or justified to increase the extraction of the low-boiling components; viz., butane and isobutane.

2. Theoretical Considerations

Cox and Arnold,[10] in a paper read before the C.N.G.A. in July 1929, presented the following formula for the oil and gas ratio required to absorb all of the normal butane that any particular type of absorber is capable of recovering under average conditions.

Oil ratio equals vapor pressure of normal butane at the temperature of the oil leaving the absorber multiplied by 75, and this result divided by the absolute working pressure of the absorber, using the same units of pressure. Stated numerically this formula is:

$$R_o = \frac{75 \times nP_4}{P}$$

This formula illustrates the fact that with increased pressure, less oil is required. It also illustrates that with reduction in absorber bottom temperature, less oil is required.

On the other hand, it is obvious that if oil rates are held constant, then with increased absorber pressure, and/or reduced absorber bottom temperature, extraction efficiencies will be increased.

In May 1930 Alois Kremser presented his "Theoretical Analysis of the Absorption Process" before the N.G.A.A. In this analysis, Kremser derived certain absorption factors which are of great practical value in the design and operation of absorption equipment. Certain definite conclusions may be drawn from this work:

1. For economical operation, and maximum extraction efficiencies, an absorber should have a minimum of 12 theoretical plates.

2. A 16-plate absorber of moderate plate efficiency will in general give better performance than an absorber of more elaborate design; but having a lesser number of plates.

3. Absorption factor is directly proportional to absorber pressure and oil rate, and inversely proportional to the molecular weight of the absorption oil, and to the vapor pressure of the individual component to be extracted taken at the temperature of the oil leaving the absorber.

4. For 99 per cent extraction of normal butane with an absorber having 12 theoretical plates, a normal butane absorption factor of about 1.3 will be required. The isobutane absorption factor in that case would be about 0.85, which means that only about 85 per cent of the available isobutane would be absorbed from the gas. For complete extraction of isobutane, the normal butane absorption factor will have to be increased to slightly less than 2.0.

If the number of theoretical plates were increased to 16, the absorption factors required for any single component would be reduced to 1.2, and for an infinite number of plates this factor would be about 0.99. Since it is doubtful if any absorber now in operation has a plate efficiency of 100 per cent, it will probably be more economical for maximum extraction of the liquefied petroleum gases to use more than 16 actual plates, in order to keep oil-rate requirements as low as possible. Unless plate efficiencies are unusually low, 24 actual plates should give excellent results.

5. From statement (3) above, it is obviously an advantage to use a high-gravity, low molecular-weight absorption oil where possible. Kremser found that the absorption efficiency of the oils investigated increased approximately 2 per cent for every degree increase in gravity between 32° and 40° A.P.I.

Since stripping of the fat oil is the opposite of absorption, the lighter oil is more difficult to strip. Only plants equipped with modern stripping equipment should attempt to use the very low molecular-weight oils, for the reason that while increased oil circulation will compensate for the lower absorption efficiency of heavier oil, there is no complete remedy against inefficient stripping. The only partial compensating factors being high-pressure absorption and adequate cooling of the lean oil.

6. The absorption factor as stated in (3) above is an inverse function of the vapor pressure of the individual component to be extracted. Because of the fact that the absorption factor is dependent on oil temperatures, perhaps in the minds of some there may be a question as to which of the temperatures, inlet or outlet, is the more significant. Obviously it is very important that the correct temperature should be used. According to Kremser, where the absorption factor is below unity, the equilibrium at the bottom of the absorber will control. With large absorption factors, the top temperature will be more indicative of the degree of extraction. However, conservative practice recommends that the outlet-oil temperature be used, in which case operating conditions will actually be somewhat more efficient than indicated by the computations.

7. The absorption factor is directly proportional to both the absolute absorber pressure and the oil rate. This does not hold exactly true under certain conditions. For instance, if the pressure is doubled, the increased saturation of the rich oil would cause a corresponding increase in absorber bottom temperature, which in turn would prevent the absorption factor from increasing in direct proportion to the increased pressure. Conversely, if the oil ratio is doubled at constant pressure, i.e., with no change in pressure, then the absorber bottom temperature will be lowered, and a somewhat higher absorption factor will be obtained than that computed by direct proportion.

Therefore, proper allowance should be made for the effect of absorber bottom temperature on absorption factor, particularly at high pressure plants.

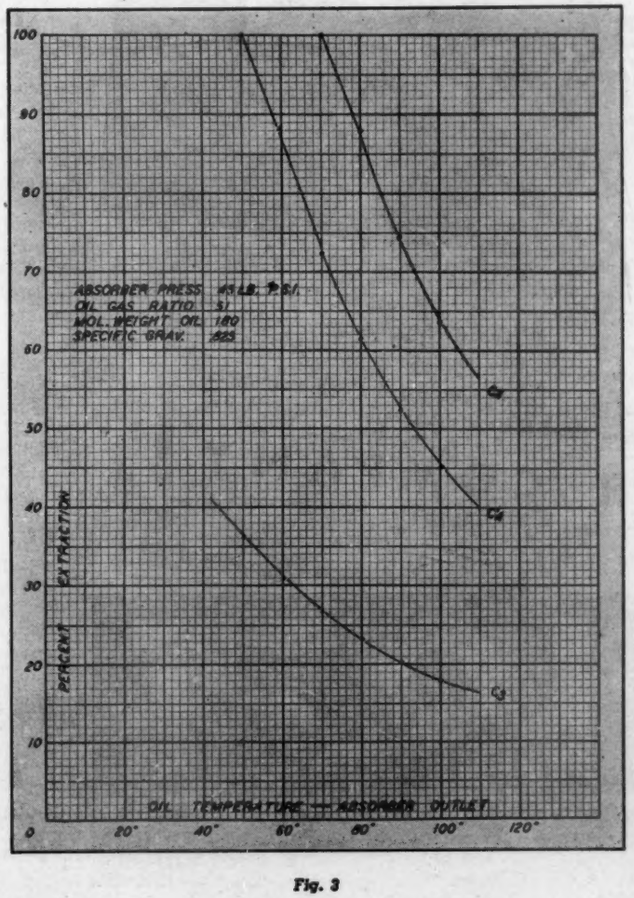


Fig. 3

3. Practical Considerations

A. A general survey should be made of plant equipment now in use.

1. Number of trays in absorbers.

2. Present operating pressures, and the possibility of raising absorber pressure.

3. Oil-circulation equipment, and the possibility of increasing oil rates, either at present absorber pressures or at higher pressures.

4. Lean-oil temperature at inlet to absorbers. Possibilities of providing more adequate cooling with existing equipment by means of cleanout work, alterations in cooling tower, water distribution, or other means which may be suggested by the inspection.

5. Lean-oil saturation. All of Kremser's theory of absorption assumed a negligible saturation of the lean oil. Adequate means for thorough stripping of the oil should be provided, including measurement of the stripping and efficient laboratory control.

6. Possibilities of providing additional compressor capacity for refrigeration work by transfer of load to underloaded compressors.

B. A general survey should be made of such idle equipment as may be located at nonoperating plants, warehouses and surplus material yards. This survey should include absorbers, exchangers, cooling towers, cooling sections, gas-engine compressors, pumps, and the necessary fittings and other materials which might be required for installations at new locations.

C. One practical method of increasing the number of effective absorber plates is to place two absorbers in series. If each absorber alone has 12 actual plates, then in series the effect will be similar to that of one absorber having a total of 24 actual plates. In this arrangement the gas should enter No. 1 absorber at the bottom, pass out at the top, and enter No. 2 absorber at the bottom. The lean oil should enter the top of No. 2 absorber, counter-current to the gas flow, and be trapped out at the bottom into a suitable surge tank. A pump should then be provided to transfer the partially enriched oil from the surge tank through an oil cooler to the top of No. 1 absorber. This arrangement provides intercooling, which will tend to remove the heat of absorption acquired in No. 2 absorber. The compensating advantages should more than offset the disadvantage of using an additional pump, which in most cases will be on comparatively light load, due to a low differential in oil-circuit pressures between intake and discharge of pump.

D. *Desirable properties in an absorption oil.*—Due[12] to the complexity and variety of crude oils, it is almost impossible to obtain from any one of them an absorption oil which has every desirable feature. Therefore, the following desirable properties of an absorption oil are listed according to their relative importance.

1. The molecular weight should be low, as absorption efficiencies increase with decrease in molecular weight of the absorption oil.

2. The oil should have a low average boiling point.

3. The boiling range should be short, i.e., around 100° F.

4. The initial boiling point should be as low as practicable with the type of distillation equipment employed, but probably should act below 400° F. in most cases.

5. The gravity should be between 38° and 40° A.P.I. (See (5) under Sec. 2.)

6. The oil should contain a low percentage of unsaturated hydrocarbons, due to their poor stability to heat and air. On the other hand, a high percentage of naphthene and paraffin hydrocarbons are desirable as they are the best absorbents, and resist oxidation, or deterioration from heat.

7. The oil should be free from organic acids and refining agents.

8. The oil should have low pour and cloud tests. The pour point should be considerably below the lowest operating temperature.

9. The oil should be sulfur free.

10. The color should be 16 to 21 Saybolt as an indication of refinement.

E. *Oil-reconditioning stills.*—Regardless of how efficient a virgin absorption oil may be, it cannot maintain its original efficiency indefinitely when in use. On the other hand, by use of continuous rerun stills, the oil can be kept at a high percentage of its original efficiency.

Cause of Contamination

Contamination of absorption oil is caused by foreign elements entering the oil-circulation system. These include rust and dust from pipe lines, lubricating oil from compressors, and in some cases crude oil, due to oil separators overflowing and filling gathering lines with crude. The rate of contamination depends upon local conditions and the efficiency of plant-intake scrubbers.

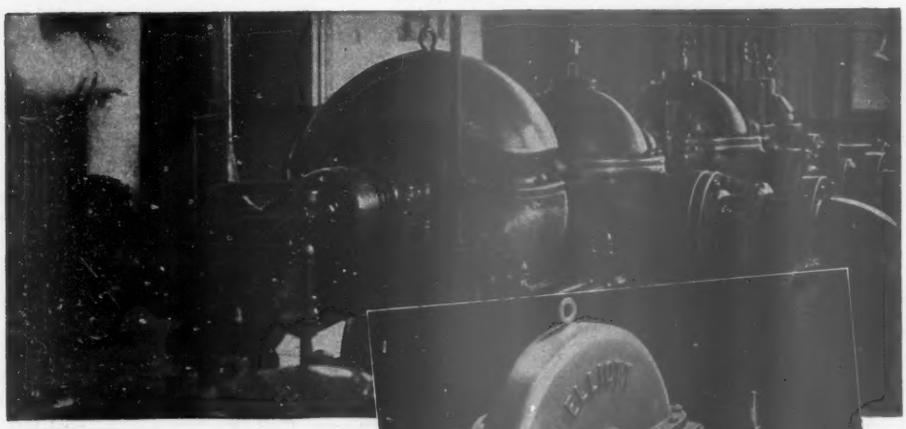
Deterioration of absorption oil in actual use, according to I. N. Beall,[13] is chiefly due to oxidation and pyrogenesis. These two phenomena work together to produce sludge and gum, causing a lengthening of the distillation range, a decrease in effective oil ratio, and an increase in power consumption.

Several types of oil-reconditioning stills have been used. These include such early types as a small steel tank mounted in a brick furnace, or an oil-field-type boiler, insulated and equipped to distill oil. Some plants have installed rather elaborate units, including fractionating columns and automatic controls. Others utilize a type that is similar in some respects to a scotch marine boiler, except that no return tubes are used; the hot gases passing through the firing tube only. In some instances the firing tube, or tubes, which may be one tube or more, is installed in the shell horizontally, and with modified Dresser connections for quick removal for cleaning. Others favor scrapers for cleaning the tube or tubes.

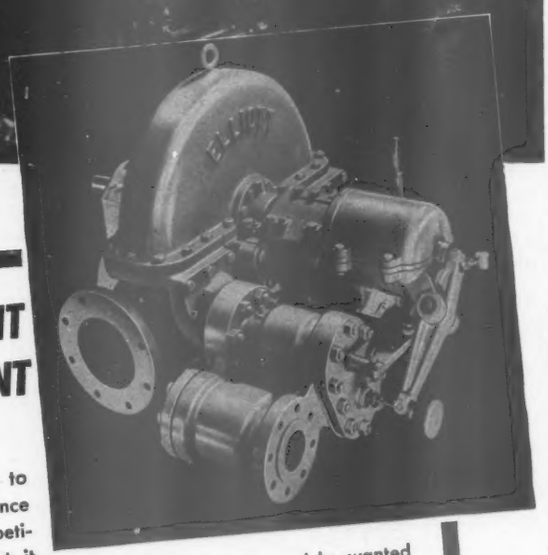
The scrapers fit around the tubes inside the shell and are moved back and forth by means of rods extending through stuffing boxes on the front head of the still.

At least two or more licensed types[14] of absorption oil-reconditioning-system designs are available.

It is recommended that where the absorption oil is in very poor condition, and where heat-



An Elliott 197-hp. turbine driving three pumps in tandem, in a natural gasoline plant. There are several similar tandem drives in this plant.



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exchange efficiencies are low, due to deposits on tubes in the oil-circulation system, that the entire system oil be dumped and the system cleaned by means of circulating some suitable cleaning compound. In severe cases it may also necessary to remove the heads from exchangers and tube bundles for manual cleaning with augers and brushes. The system should then be filled with fresh virgin oil and operations resumed.

The oil rerun still should be started soon after resuming operations, in order to maintain the efficiency of the new oil as long as possible.

F. *Absorber pressures.*—While absorption factor is directly proportional to both the oil ratio and the absolute absorber pressure, it is usually more economical to obtain an increased absorption factor by means of elevating pressures than by increasing oil rates. This is particularly true where a shortage of residue gas for fuel exists, or where the residue gas has a sales value.

In most plants now operating at absorber pressures of less than 50-lb. gage, it will be found that these pressures can be safely raised to 60 or even 75 lb. gage. However, before doing so, it would be well to check the safe working pressures of the equipment involved with the manufacturer, and in cases where corrosion is suspected it would be advisable to make an internal examination of this equipment before raising pressures much above present levels.

In some instances it may be found desirable to install high-pressure equipment if such is available, particularly at points where residue gas is now being boosted into high-pressure lines. It was our privilege recently to examine operating data from a plant[18] operating at 300 lb. gage absorber pressure, and with oil rates sufficient to maintain outlet-oil temperature at approximately 100° F. Low-temperature analyses of the inlet and outlet gases were as follows:

INLET GAS	Mol %	OUTLET GAS	Mol %
C_1	74.24	C_1	88.17
C_2	9.24	C_2	9.09
C_3	7.51	C_3	2.74
i-C_4	1.30	i-C_4+	0
C_4	3.03		
C_5+	4.68		
	100.00		100.00

Oil ratio in the above instance amounted to 30.8 gal. per 1,000 cu. ft., and actual extraction checks reasonably close to a normal butane factor[11] of 2.71 for 100 per cent extraction of isobutane, and approximately 59 per cent extraction of propane. Actual extraction of propane was 63.52 per cent. This higher actual extraction bears out the earlier statement that where bottom temperatures are used in computing the absorption factor, the computations are conservative.

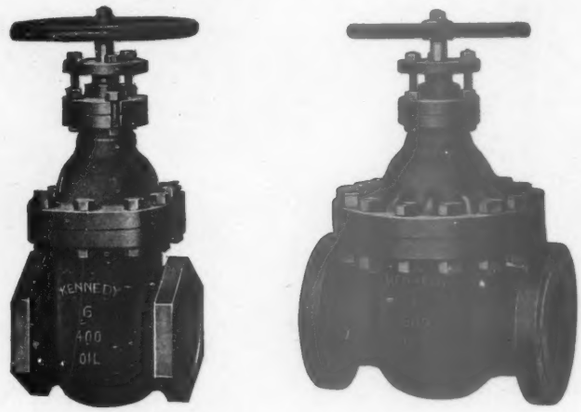
G. *Refrigeration.*—In recent years, many operators have resorted to refrigeration as a means of chilling the lean oil, and in a number of instances refrigeration is being used to remove the heat of absorption from the oil, part way down the absorber, as well as chilling the lean oil entering the top of the absorber. Either method is an effective and comparatively simple and inexpensive method of increasing extraction efficiencies at the average gasoline plant. This is particularly true where idle or underloaded compressor capacity exists. One of the liquefied petroleum gases is usually employed as the refrigerant. If possible, a reasonably pure hydrocarbon, either butane or propane, should be used, since the mixed hydrocarbon presents the bad feature of high condensation pressure as related to vaporization-temperature pressures. This, of course, increases the ratio of compression and the horsepower required for any given B.t.u. extracted per hour.

As an example: A liquefied petroleum gas mixture, having a mol per cent as follows C_3 — 20 per cent, i-C_4 — 30 per cent and C_4 — 50 per cent, would have a vapor pressure of 85.6 at 100° F. Pure normal butane, of course, would have only 52 lb. abs. at 100° F. If we vaporize these refrigerants at 60° F., the pressure on the vaporizer, i.e., compressor suction, will be approximately the same in both cases, or 26.3 lb. abs., because it is necessary to lower the pressure to a point where the heaviest component in the mixture will vaporize at the vaporization temperature. However, the pressure required to condense the liquefied petroleum gas (LPG) mixture will be 85.6 lb., or 33.6 lb. higher than for pure butane. The compression ratio for the LPG mixture would be 3.25 while that for pure butane would be 1.98. The difference in horsepower required, per million cubic feet, would be approximately 28 hp. greater for the LPG mixture than for the pure butane.

Obtaining Improved Efficiency

In many cases, great improvement in extraction efficiency can be obtained with refrigeration equipment salvable around most plants. The same conditions prevail in cooling absorption oil by refrigeration as apply to any other efficient heat transfer. It is desirable to pass the oil through the tubes of the cooler in order to obtain turbulent flow. The ebullition of the refrigerant helps to maintain turbulence in the shell of the cooler and obviates one of the problems of heat transfer.

It might be mentioned here that any cooling done by refrigeration must be offset by additional cooling load on condensing equipment equal to the B.t.u. per hour handled by coolers, plus the heat of compression; otherwise, the addition of



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WHEN you close a Kennedy Valve, you will find ample leverage on the handwheel, smooth positive operation, and tight closure without strain. When the valve is to be opened again, you will find instant release of the operating mechanism at the first turn of the wheel, and free, easy motion.

Kennedy Valves are built to work effectively and dependably whether they are operated several times a day or infrequently. Each type is designed and tested to withstand far more than rated pressure and their ample margin of strength also protects against pipe strains and water hammer.

The extensive Kennedy line includes gate valves, for 250-lb., 400-lb., 500-lb. and 800-lb. oil, water or gas working pressures, as well as many other types of gate, globe, angle and check valves for a wide range of service, together with standard types and sizes of malleable iron screwed fittings and cast iron flanged fittings.

The Kennedy Valve Mfg. Co., Elmira, N. Y.
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VALVES with Extra Value

"Since we got interested in saving steel, we found out how much money we save too with MacCLATCHIE "AIRFLOTE" PUMP VALVES!"

FIRST cost of a mud pump valve won't drain the average drilling budget by a long shot. But when you have to *keep on* buying and *keep on* replacing valves and seats, you soon have a sizeable maintenance bill on your hands!

That's why MacClatchie "Airflote" Valves fit into the picture so well right now . . . for the renewable parts features of these valves not only save your steel equipment needs but the Valve itself is made to give you *more* trouble-free months of pump operation as well . . .

EVERLASTING STEM CAP, now hardened, is practically indestructible and can be used over and over again. By simply adding a new body and insert to the stem cap, new valve performance is obtained.

REVERSIBLE INSERTS. New improved composition inserts made in MacClatchie's own factory give a positive fluid seal at highest pressures. Thicker and thus longer wearing. Afford greater sealing surface and make both valve and seat last longer. When worn, they can be reversed to give you *double* wear, *double* economy.

REPLACEABLE VALVE BODY is heat-treated to give long life under hard usage. The valve body absorbs the impact *over its entire surface* and is economically replaced when worn. The MacClatchie valve body constitutes only half of the valve —the other half being the everlasting stem cap. Consequently, MacClatchie bodies cost only about half that of other makes.

LONGER LASTING SEATS. "Airflote" Valve Seats have 50% to 100% *more* striking surface than others, absorbing the valve blow over their entire circumference and practically all of the patented built-in cross bar. The larger striking surface of the cross bar keeps the valve from pounding down into the seat. Yet seats have ample open area to permit smooth fluid passage and prevent sanding up.

SMOOTHER PUMP PERFORMANCE. You can't expect a heavy, sluggish valve to lift fast and respond instantly to pressure changes . . . or give the silky-smooth pump performance you want to reduce equipment wear and expense. *The "Airflote" has a fluid-tight air chamber that greatly increases its buoyancy, without sacrificing strength or rigidity.* It lightens the valve action so that the valve responds instantly to changes in flow and gives *far less impact* at each reversal of the pump stroke. In addition, this feature reduces valve seat erosion and insures longer valve and seat life.

These important MacClatchie "Airflote" Valve advancements will cut operating and maintenance costs on *all* your pumping jobs . . . and insure smoother, longer mud pump performance as well. "Airflotes" are made in 65 sizes and types for all pump installations. Write MacClatchie today for details—or order a set direct from your supply store!

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refrigeration equipment adds to the total B.t.u. per hour load on the cooling tower.

Self-explanatory charts[16] furnished will show graphically the horsepower required per million cubic feet per day (Fig. 1), the horsepower required to cool 100 g.p.m. 1° (Fig. 2) and the increase in extraction resulting from lowering the absorption oil temperature (Fig. 3).

H. *Removal of light gases from the fat oil.*—So far this discussion has been principally concerned with the actual extraction of the liquefied petroleum gases from the gas processed in the absorber. It should be remembered that with the increased absorption factor required for maximum extraction of butane, the absorption of propane, ethane and methane will also increase. The presence of larger quantities of these high-vapor-pressure components in the fat oil amplifies the problem of maximum recovery of the butanes from the oil.

Some methods for reducing the C_4 losses on the condensing and fractionating and of manufacture include:

1. Deethanizing the fat oil by means of an oil fractionator.

2. A series of pressure stepdown vent tanks installed so as to vent, as closely as possible, the methane and ethane from the first tank. The retained methane and ethane, a large portion of the propane, and some amount of the heavier fractions might then be vented from the second and lower pressure tank to a reabsorber. Vapors from the third or low pressure tank might enter a recompressor, or possibly the vapor condenser on the distillation unit.

I. *Follow-up on operations.*—For best results in operation, it is essential that proper follow-up be made of all pertinent operating data daily. This should be the duty of a competent and experienced engineer, familiar with the design and operating conditions of the plant, or plants, under his observation.

It has been suggested that the technical committee of the N.G.A.A. be assigned the problem of determining the most essential data for intelligent analysis of plant operations for use by the industry, in our all-out effort to supply sufficient liquefied petroleum gases for the war program.

4. Economics

The question naturally arises: How far can the natural-gasoline operator go in adding investments, increasing his operating costs, possibly rerouting his processing steps, all to squeeze the last gallon of the butanes from his gas? The economic limits will vary with the individual plant, and there is considerable difference in opinion as to just what these limits are. Unless the operator has some definite idea of prices in advance, he cannot make a reliable estimate of the expenditures he can justify. As a liquefied petroleum gas fuel, butane has not been too attractive to some operators, due to various reasons, including the difficulties in handling, storage, transportation and price. As a raw material, essential in a chemical process to produce rubber, butane acquires new status. When Messrs. Alden, Trimble and McReynolds[17] describe the probabilities of using propane as the volatility agent for motor fuel, the new trend is plain.

When we debutanize normal blending grades of natural gasoline to obtain additional butane for chemical synthesis, the new base line is at least the value of natural gasoline. Starting with such a base line, the smaller operator can view his butanes as a liquid in a better light than when his only outlet for these components is a competitive fuel market.

In Germany, we are told, butadiene is manufactured by an extremely complicated process. Coal and lime yield carbide; carbide and water yield acetylene; acetylene and water yield acetaldehyde; acetaldehyde and lime yield aldol; aldol and hydrogen yield butyl glycols, and at long last, by a process of catalytic pressure treatment, butyl glycols are converted into butadiene. Of course this long and complicated method is due to the lack of adequate supplies of petroleum and its derivatives.

In our country, so amply provided with petroleum and natural gas, we have many short cuts to butadiene production. Of these shorter methods, the use of butane as the starting agent is certainly the shortest from the standpoint of speeding up the development and production of Buna-S rubber. For this reason, as well as the huge volumes needed for 100-octane gasoline, and other war requirements, it is inconceivable that the use of butane for these purposes will be necessarily restricted because the economics of inequitable returns to the manufacturers of the butanes prevent their concentrating serious attention on the problem of effecting full butane recovery in liquid form. It is conceivable, however, that as the subber program gathers momentum, it may become imperative that we recover all of the butanes as a liquid from the gas processed, or at least within the limits of the equipment available.

Our prompt attention to what will ultimately be necessary in new plant equipment, utilization of existing idle equipment, or changeover of equipment now operating, together with possibly better operating procedures, even though more costly,

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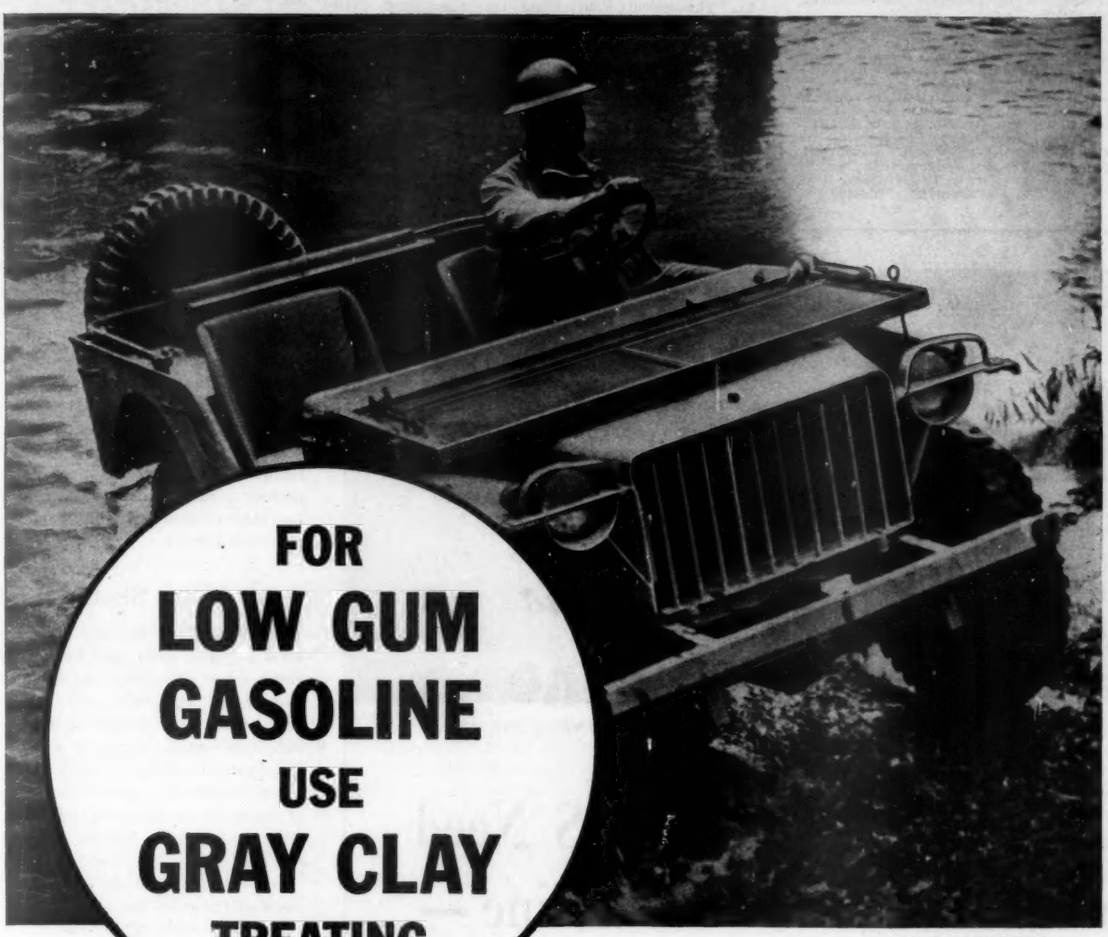

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Gray refined gasoline is Gum Stable because gum-forming elements are removed

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will without delay enable us to determine what we will need in economical return to operate under maximum recovery conditions.

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PETROLEUM ENGINEERING, Inc.

Tulsa, Oklahoma **Houston, Texas**

Testing of High-Pressure Gases

(Continued from Page 65)

its use for specific gravities in the oil industry is relatively new. Results obtained on gas at this well were entirely satisfactory and the committee wishes to thank F. M. Poole, Poole Engineering Co., Dallas, Tex., for his cooperation.

For laboratory analysis, four gas samples were taken from the downstream end of the orifice-meter setting and four condensate samples were taken from the separator at separator pressure. The results of these analyses are not yet available.

Of necessity this is largely a progress report and more complete data will not be available for some months yet. Present plans call for continuance of the test series throughout the summer, if the war does not interfere, and the committee should have some conclusions ready early in the fall.

One point on which the committee wishes to be entirely clear is that anyone who has a testing devise or method is perfectly welcome to take part in our program. Observers are also welcome and we will be glad to send notices of when and where tests are to be held to anyone desiring this information. For the time being most of the collected data is for the committee and participating laboratories only but a complete report will be made later.

●

Rotary Slips Should Be Kept Sharp

MOST of the modern types of slips used to support drill pipe in the rotary table have replaceable gripping sections or dogs. These should be kept sharp at all times and a spare set should be available to the crew so that the old ones can be replaced at the first indication they are not holding properly. With the older-style models it is necessary to have an extra set of slips or to adopt a program of having the slips sharpened before the failure point is reached.

Dull slips introduce a possibility of dropping the drill pipe as one slip may be pulled through the rotary table while the other slides upward and out. If the slip goes through the rotary table and falls in hole, fishing is further complicated.

There are also numerous minor dangers to the crew, as driving the slips into the rotary table, prying them in, setting a sledge between the top of the slip and the elevators and other attempts to get the slips to hold are all hazardous. There is also the chance a man might mash his hand.

From the drilling contractor's standpoint, the use of dull slips is extremely costly. The waste of 15 or 30 minutes during a trip while the crew fights with the slips costs the contractor more money than a sharpening job. This is especially noticeable when a fishing job is in progress as each minute's delay in contacting with the fish adds to the difficulty of cleaning up of the job.

Slips that are giving minor trouble can often be made to hold by cleaning them and the bowl of the rotary table and then greasing the back of the slips. Setting one slip higher than the other also helps, although it may mash the drill pipe. Small new roughness can be obtained with a chisel on the face of the slips but care should be taken while doing this to prevent a piece of steel from getting in a workman's eye. Even a minor roughness is helpful as it will pull the slip far enough into the rotary table so the duller teeth can get a grip.

As soon as the drill pipe is back on bottom after experiencing trouble with the slips, the dogs should be replaced and the old ones sent in for repair. There is no substitute for sharp and properly conditioned slips on the rig.

CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

MAY 14, 1942

BREAKDOWN OF RIG TIME HELPS IN ESTIMATING COSTS

THE value of a study of the efficiency of any rotary-drilling rig can be improved by a study of the results generally obtained by this method of drilling. Such a study should not be carried too far, and too much dependency should not be placed in the general figures as they are only averages and as such are apt to be deceiving.

For instance, some firms have compiled extensive data on the drilling time of every well drilled, in all sections of the country, and have attempted to arrive at some base for estimating prospective work on these figures. In every case they have found that these figures were of no help.

The over-all time required to drill a well is likewise deceiving as it contains too many factors that are not common to all wells or may not be applicable to the well to be drilled.

There are always a certain number of mechanical failures which may be expected although here again comparisons are difficult because in one case an antique or an absolescent rig might have been used and a new, modern rig in the other.

The most difficult factor to estimate is the danger of a fishing job delaying the completion of the test. This will depend to a great extent on the skill of the crew, the condition of the drill pipe and the thought given to planning the mud program. The type fishing job causing the longest delays is stuck drill pipe, which on deep wells may run into a matter of months.

There are other factors which make it impossible to compare gross time on wells but the above are the more outstanding. All of these factors must be taken into consideration when estimating the cost of drilling a particular well but they cannot be used when comparing drilling time, and comparative hardness of drilling in different areas.

For that purpose, net time, or the time actually spent in the drilling of the wells, is to be preferred. This may be computed in either hours or days and then further simplified by converting either to feet per hour or hours per foot, whichever is desired. The accompanying table shows an analysis of nine wildcats drilled in several sections of the country. These wells all have one thing in common, i.e., they were all drilled with rock bits and they were all of average-hole size.

The first four of these wells are located in what is definitely known as hard-rock country. It is interesting to note that all but one of these actually spent less than 50 per cent of the time on bottom and that the rate of penetration for all four averages less than 5 ft. per hour. The fifth and sixth wells are deeper than those normally drilled in their respective areas, while the seventh, eighth, and ninth wells are only slightly deeper than normal for their areas. On the average, both the time on bottom and the rate of penetration are greater for the latter three.

Taking the group as a whole, it is seen that the average time on bottom for a wildcat well is 50.6 per cent, the remaining 49.4 per cent being devoted to making trips, circulating for samples, electric logging, coring, and other necessary operations. Probably field wells average about 55 to 60 per cent of the time on bottom.

This is not a surprising fact but it is a very important one. Much thought has been given to increasing efficiency in moving and rigging up while comparatively little has been given to the broader field of increasing the efficiency while on bottom. This is the major consideration and when the figure of at least 55 per cent for the time spent on bottom is considered, it warrants the installation of equipment designed to drill the hole rather than for speed in moving.

It also indicates the importance of rate of penetration when outlining a bit program. Normally, the rate of penetration is given a value of unity when determining whether a bit should be changed. Actually it should be given a value of about 2 on charts where the rate of penetration is compared to rig-operating costs.

The average rate of penetration of 5.75 ft. per hour is of comparatively small value, a more important factor being the rate of penetration for the individual formations in each particular area. However, it does indicate that whenever the rate of penetration is less than 5 ft. per hour, the formation is either unduly hard or the bit is worn out.

Of interest, because it shows the effect of a fairly small amount of hard formation on the average rate of penetration, is the third well. The average rate of penetration was 2.8 ft. per hour but the last 268 ft. required 863 hours to drill, an average of 0.3 ft. per hour. If the well had been stopped before this hard streak was drilled, the rate of penetration would have been 3.9 ft. per hour. This interval also shows the least time spent on bottom when compared to the total elapsed time, which indicates that the trips were frequent.

Well	Depth	Total elapsed time	On bottom		Ft./hr.	Bit off bottom	
			Hours	Per cent		Hours	Per cent
1	7,777	3,336	1,425	42.7	5.5	1,911	57.3
2	6,825	2,208	1,015	45.9	6.7	1,193	54.1
3	10,018	6,672	3,541	53.1	2.8	3,131	46.9
	9,750-10,018	2,262	863	38.2	.3	1,399	*61.8
4	7,325	3,312	1,444	43.6	5.0	1,868	56.4
5	6,470	1,056	464	43.8	6.9	592	56.2
6	9,294	2,984	1,736	57.9	4.4	1,148	42.1
7	6,837	1,128	626	55.6	10.9	502	44.4
8	4,538	456	316	69.3	14.4	140	30.7
9	5,630	1,056	679	64.3	8.3	377	35.7
Total	64,714	22,208	11,246	50.6	5.75	10,862	49.4

*Not included in total.

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STUDY OF PUMP OPERATION REDUCES EXPENSE

THERE are some in the oil industry who claim that too many types of pumps are made, while others believe that practically each individual installation should differ from all others. This argument has been going on for years and will probably continue as long as petroleum is lifted from the ground. Each operator naturally seeks to make the installations which for him are the cheapest; often slight changes will cause great increases in efficiency and reductions in cost of operation.

In oil-well pumps, as in most other things, the purchaser practically always gets exactly what he pays for; there are no bargains. This is typified by the common working-barrel pump in comparison with the liner-type and metal-to-metal pumps. If the common working barrel were made to the precision measurements that other types are held to, and if the proper number of cups were used and fitted to close tolerances, the initial cost would go up but the service obtained would also approach that obtained from the more expensive pumps.

At the present time, considerable experimentation is in progress to increase the service obtained from pumps consisting of an improved working barrel and an increased number of composition cups. Results to date indicate that where suitably located, such pumps may turn in outstanding performances.

Continuous Study Necessary

This serves to illustrate a very important point, namely that if the minimum operating costs are to be maintained, an operator of any considerable number of wells must continually study the operation of different types of pumps to make sure he is using the most economical one.

The following tabulations show the comparison of operating costs for a number of different types of pumps. In this case, five different pumps were run in wells similar to five wells equipped with common working barrels and four-cup plungers. The summarization of Table 2 is shown in Table 1. For the purpose of this study it was assumed that all types of pumps were completely depreciated in 2 years.

Comparison was made through two figures, average cost of pump per day and average cost of pump per barrel of fluid lifted. The average superiority of insert pumps in the former case was 380 per cent and in the latter case was 435 per cent.

It should be noted that one of the principal cost factors is the rod breakage which averaged 14.2 for the common working-barrel pumps. It would be expected that the pump showing the greatest volumetric efficiency would be the cheapest to operate. However, this is not the case due to an increase in rod breaks. (Note Type C.) This in turn leads to the conclusion that the pump was not being operated at the proper speed and stroke and that a study of the pumping-unit operation is needed.

TABLE 1

Kind of pump—	Ave. dly. prod. Oil	Ave. dly. prod. Water	Average rod breaks	Aver. cost of pump per day	Aver. cost of pump per bbl. fluid
Common working barrel W/4-cup traveling valve	17.4	226	14.2	0.5786	0.00383
Insert pumps	18.4	204	3	.1205	.000716

TABLE 2

Size and kind of pump—	Days serv.	Aver. prod. test Oil	Aver. prod. test Water	Aver. pump motion S.p.m.	Aver. pump motion Length	Vol. eff.	Cost of pump comp.	No. of pump jobs	Cost of pump jobs	No. of rod breaks	Total cost of pump	Cost of pump per day	Cost of pump per bbl. fluid	Cost of pump per bbl. oil
2¼, 4-cup valve and common working barrel	227	2.5	144	19	34	38.4	$43.00	8	$98.44	8	$107.81	0.475	0.0032	0.19
2½ by 9 inverted Type A	227	5.6	60	18	28	27.1	48.12	None	None	2	14.97	.066	.001	.012
2¼ by 2¾ traveling valve	396	37	197	23	34	26.2	74.37	32	$324.44	44	364.78	.921	.0039	.025
2½ by 9 inverted Type B	396	35	203	22	34	68.4	69.20	5	82.22	9	119.73	.302	.0013	.0086
2¼, 4-cup valve and common working barrel	227	22.3	154	20	34	43.9	43.00	8	78.79	12	92.16	.406	.0023	.0182
2½ by 7 Type C W/1½ plunger	227	18.8	203	24	34	100	53.65	None	None	3	16.69	.0735	.00033	.0039
2¼, 4-cup valve	111	12.7	53	23	24	20.3	43.00	6	58.90	6	65.44	.589	.0089	.0464
2-in. Type D 1½-in. bore	111	19	47	20	24	52.4	35.05	None	None	4	5.33	.048	.00073	.0025
2¾, 4-cup traveling valve and common working barrel	239	12.7	583	22.3	44	68.8	74.37	11	95.58	13	119.90	.502	.00084	.04
3 by 9 Type E inverted	239	13.7	509	23.5	44	76.3	70.22	None	None	1	26.90	.113	.00022	.008

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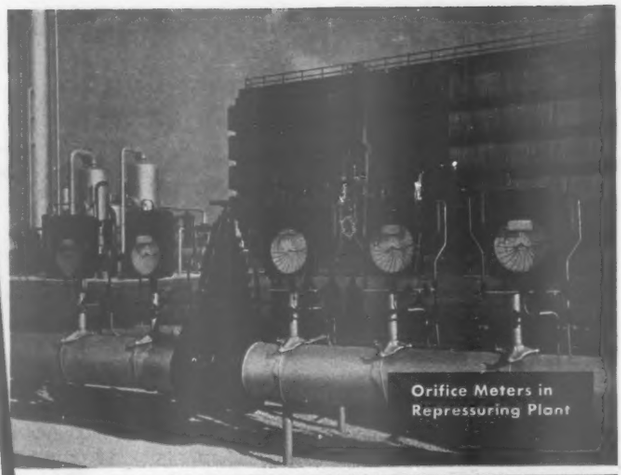
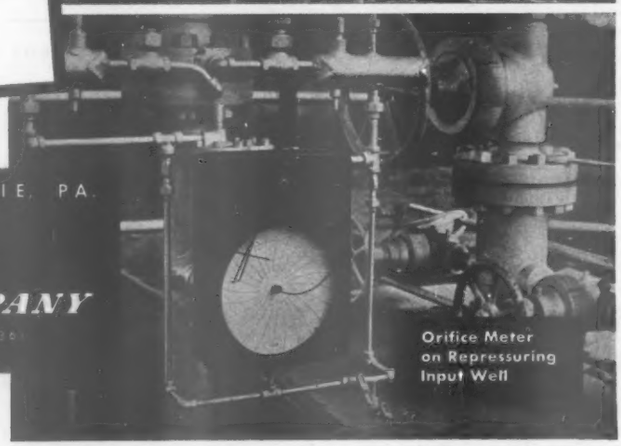


Orifice Meters in Repressuring Plant

Orifice Meter on Christmas Tree at Distillate Flowing Well



Orifice Meter on Repressuring Input Well

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Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 14

MAY 14, 1942

CALCULATION OF GAS RESERVES BY PRESSURE-VOLUME METHOD

THE pressure-volume method of estimating gas reserves can be used when there has been sufficient withdrawal from the gas sand to cause an appreciable decline in the reservoir pressure.

The factors needed for calculating reserves by this method are:

1. Accurate measurement of the gas volume withdrawn from the sand prior to the reserve estimate.

2. Accurate record of the reservoir pressure which existed prior to the withdrawal of the volume mentioned above.

3. Accurate pressure measurements from which to determine the reservoir pressure existing after the withdrawal of the measured volume of gas.

4. Information concerning the deviation of the gas from the law of perfect gases.

5. Allowance for changes in reservoir volume that may be caused by water or oil encroachment.

From a practical standpoint, the problem of calculating reserves by this method can be most easily and quickly handled by substituting volume directly in the following formula:

$$Q = \frac{V_w(P_2 d_2 - P_a d_a}{(P_1 d_1 - P_2 d_2)}$$

Where:

Q = gas reserves, expressed as cubic feet measured at standard pressure and temperature, that can be produced while the reservoir pressure declines from P_2 to P_a

V_w = gas withdrawals, expressed in terms of cubic feet measured at standard pressure and temperature, during the period of pressure decline from P_1 to P_2

P_2 = formation pressure, lb. per sq. in., abs., immediately following withdrawal of gas volume, V_w

P_1 = formation pressure, lb. per sq. in., abs., at beginning of withdrawal of gas volume, V_w

P_a = formation pressure, lb. per sq. in., abs., at abandonment

d_1 = deviation factor at pressure, P_1

d_2 = deviation factor at pressure, P_2

d_a = deviation factor at pressure, P_a

Example 1.

Problem.—The initial reservoir pressure in a gas field was 800 lb. per sq. in., abs. A volume of 582,700,000 std. cu. ft. of gas was produced from the field after which the reservoir pressure was 750 lb. per sq. in., abs. Standard conditions are 14.7 lb. per sq. in., abs., and 60° F. Reservoir temperature is 100° F. Specific gravity of the gas is 0.60. The field is to be abandoned when the reservoir pressure declines to 100 lb. per sq. in., abs.

Calculate the number of standard cubic feet of gas that should be withdrawn from the field in the future, assuming 100 per cent recovery and assuming no encroachment of water or oil on the flanks of the structure.

Solution.—Substituting values in the formula given above, and taking values for the various deviation factors from Table 2, Installment 11, we obtain:

$$Q = \frac{582{,}700{,}000(750\times 1.093 - 100\times 1.01)}{(800\times 1.099 - 750\times 1.093)}$$

$$= 7{,}041{,}930{,}000 \text{ std. cu. ft.}$$

In connection with the operation of a new gas field, it is often desirable to be able to estimate early in the life of the field not only the gas reserves but also the possible productive area, or lateral extent, of the gas reservoir. This may be of value to a gas-producing company in planning its development program, particularly as to the capital investment that will be required to completely drill the field with a given well-spacing program. With some field data and some justifiable assumptions, the law of perfect gases can be applied to make an estimate of the productive area of a field after one or more wells have been produced long enough to cause an appreciable decline in reservoir pressure. The example which follows illustrate a method of analysis that may be applied.

Example 2.

Problem.—Suppose that in the field of Example 1, there has been only one well drilled to date. All of the data given in Example 1 was obtained during the withdrawal of gas from the one well. By drilling through the producing sand at this well it was found that the productive sand thickness was 8 ft. Cores taken from the well showed an average effective porosity of 16 per cent.

Estimate the productive area, in acres, of field when fully developed.

Solution.—One would be justified in making the assumption that the sand thickness and porosity is uniform throughout the field. It would be unusual for this to be entirely accurate, but in the absence of other information it would be a logical assumption.

It is believed unnecessary to consider deviation from the perfect gas laws in such an estimate, since the accuracy of other data used is not on a comparable basis.

Let V_r = the unknown volume of pore space in the reservoir. Then, from the law of perfect gases, the number of standard cubic feet of gas (V_1) in the reservoir initially was

$$V_1 = \frac{800\times V_r \times (460+60)}{(460+100)\times 14.7} = 50.53\, V_r^*$$

In a similar manner, the number of standard cubic feet of gas in the reservoir after the given withdrawal may be figured as

$$V_2 = \frac{750\times V_r \times (460+60)}{(460+100)\times 14.7} = 47.37\, V_r$$

It is known that the withdrawal was 582,700,000 cu. ft. So,

$$V_1 - V_2 = 50.53\, V_r - 47.37\, V_r = 582{,}700{,}000$$

$$\text{So} \quad V_r(50.53 - 47.37) = 582{,}700{,}000$$

$$\text{or,} \quad V_r = \frac{582{,}700{,}000}{3.16} = 184{,}398{,}700 \text{ cu. ft. of pore space}$$

Then the volume of the sand body, assuming a uniform porosity of 16 per cent, would be

$$V = \frac{184{,}398{,}700}{0.16} = 1{,}152{,}492{,}000 \text{ cu. ft.}$$

The lateral extent of the sand, assuming a uniform thickness of 8 ft., would be

$$A = \frac{1{,}152{,}492{,}000}{8} = 144{,}061{,}500 \text{ sq. ft.}$$

or

$$\frac{144{,}061{,}500}{43{,}560} = 3{,}307 \text{ acres}$$

*This is easily seen to be true if subscript 1 represents standard conditions and subscript r represents initial reservoir conditions of the same gas. Then, $\frac{P_1V_1}{T_1} = \frac{P_rV_r}{T_r}$, or $V_1 = \frac{P_rV_rT_1}{T_rP_1}$.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 15

MAY 14, 1942

CALCULATION OF PRESSURE EXERTED BY A COLUMN OF GAS IN A WELL

BY use of integral calculus and the law of perfect gases, a formula can be derived from which to calculate the pressure exerted by a static column of gas in a well. This derived formula is*

$$P_s - P_1 = P_1 \left(e^{GL/53.34T} - 1\right)$$

Where

P_s = pressure at bottom of well, lb. per sq. in., abs.
P_1 = pressure at well head, lb. per sq. in., abs.
$P_s - P_1$ = pressure due to weight of static gas column, lb. per sq. in.
L = average length of gas column, ft.
G = specific gravity of gas (air = 1.00)
e = Naperian logarithm base = 2.71828
T = average temperature of gas in well, °F. abs. (°F. + 460)

This formula does not take into account the deviation of the gas from the law of perfect gases. The formula is very useful, however, if one is concerned with a calculation of the weight of the gas column in a well which does not have too high a well-head pressure or too great a value of *GL*. For example, if the *GL* value (product of specific gravity of the gas and length of the gas column) is below 4,000 and the well-head pressure is below 600 lb. per sq. in., the error due to neglecting deviation would be less than 10 lb. per sq. in., when dealing with reasonably dry natural gas.

With lower values of *GL*, the well-head pressure could be higher than 600 lb. per sq. in. and yet maintain the error due to neglecting deviation below 10 lb. per sq. in. Similarly, with lower well-head pressures the *GL* value can be higher than 4,000 without resulting in an error, due to deviation, of more than 10 lb. per sq. in. in the determination of the pressure exerted by the gas column.

Anyone dealing with such a calculation must necessarily consider the conditions in the well (depth, specific gravity of gas, well-head pressure, and possible deviation characteristics of gas) and the accuracy desired for the purpose at hand in order to decide whether the formula given above should be applied, or whether another formula in which deviation is included should be used.

It is certain that in estimating gas reserves of many pools that do not have excessive well depths or well-head pressures, use of this formula will yield sufficiently accurate results.

In Table 1, values are given for $e^{GL/53.34T}$ that can be used in solving the formula.

*A derivation of this formula can be found on p. 162 of "Back Pressure Data on Natural Gas Wells and Their Application to Production Practices," by E. L. Rawlins and M. A. Schellhardt, U. S. Bureau of Mines, Monograph 7, 1936, revised 1939.

TABLE 1—VALUES OF $e^{GL/53.34T}$

	Temperature °F.		
GL	80	120	160
500	1.0175	1.0163	1.0152
600	1.0210	1.0196	1.0183
700	1.0246	1.0229	1.0214
800	1.0282	1.0262	1.0245
900	1.0317	1.0295	1.0276
1,000	1.0353	1.0328	1.0307
1,100	1.0389	1.0362	1.0338
1,200	1.0425	1.0395	1.0370
1,300	1.0462	1.0429	1.0401
1,400	1.0498	1.0463	1.0433
1,500	1.0535	1.0497	1.0464
1,600	1.0571	1.0531	1.0498
1,700	1.0608	1.0565	1.0528
1,800	1.0642	1.0599	1.0559
1,900	1.0682	1.0633	1.0591
2,000	1.0719	1.0668	1.0623
2,100	1.0756	1.0702	1.0656
2,200	1.0794	1.0737	1.0688
2,300	1.0831	1.0772	1.0720
2,400	1.0869	1.0807	1.0753
2,500	1.0907	1.0842	1.0785
2,600	1.0945	1.0874	1.0818
2,700	1.0983	1.0912	1.0851
2,800	1.1021	1.0947	1.0884
2,900	1.1059	1.0983	1.0917
3,000	1,1098	1.1018	1.0950
3,200	1.1175	1.1090	1.1017
3,400	1.1253	1.1161	1.1083
3,600	1.1331	1.1234	1.1150
3,800	1.1410	1.1307	1.1218
4,000	1.1490	1.1380	1.1286
4,200	1.1570	1.1454	1.1354
4,400	1.1651	1.1528	1.1423
4,600	1.1732	1.1603	1.1492
4,800	1.1813	1.1678	1.1562
5,000	1.1896	1.1754	1.1632
5,200	1.1979	1.1830	1.1703
5,400	1.2062	1.1907	1.1774
5,600	1.2146	1.1984	1.1845
5,800	1.2231	1.2062	1.1917
6,000	1.2316	1.2140	1.1989

Example 1

Problem.—The well-head pressure of a gas well is 400 lb. per sq. in., gage. Atmospheric pressure is 14.0 lb. per sq. in., abs. The specific gravity of the gas in the well is 0.70. Average temperature of the gas column is estimated at 120° F. There is no liquid, such as oil or water, in the hole. What is the pressure exerted by the column of gas in the well to the mid-point of the gas sand which is 3,250 ft. below the surface? What is the absolute pressure in the gas sand?

Solution.—The pressure at the well head is 400 + 14, or 414 lb. per sq. in., abs.

GL = 0.70 × 3,250 = 2,275

From Table 1, interpolating between *GL* values of 2,200 and 2,300, the value of $e^{GL/53.34T}$ is found to be 1.0763.

Then the pressure exerted by the gas column is

$P_s - P_1 = 414\ (1.0763 - 1) = 31.6$ lb. per sq. in.

The absolute pressure in the gas sand at the time the well-head pressure is read is then

$P_s = 31.6 + 414.0 = 445.6$ or 446 lb. per sq. in.

Example 2

Problem.—An accurate check of the temperature in the well of Example 1, showed that the estimated temperature of the gas column was too high. The actual average temperature was found to be 100° F. instead of 120° F. What is the pressure due to the weight of the gas column, using the correct temperature value?

Solution:

$P_1 = 414$ (Example 1).

$GL = 2{,}275$ (Example 1).

From Table 1, interpolating between *GL* values of 2,200 and 2,300 and between temperature values of 80° F. and 120° F., the value of $e^{GL/53.34T}$ is found to be 1.0791.

Then the pressure exerted by the gas column is

$P_s - P^1 = 414\ (1.0791 - 1) = 32.7$ lb. per sq. in.

It is interesting to note that even though the value of the temperature of the gas column was in error by 20° F., the error in the calculated pressure due to the gas column was only 32.7 — 31.6, or 1.1 lb. per sq. in. This indicates that for ordinary purposes sufficiently accurate results will be obtained by intelligently estimating the average temperature of the gas column rather than attempting to accurately measure it.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

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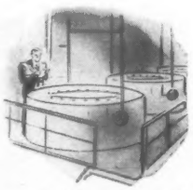

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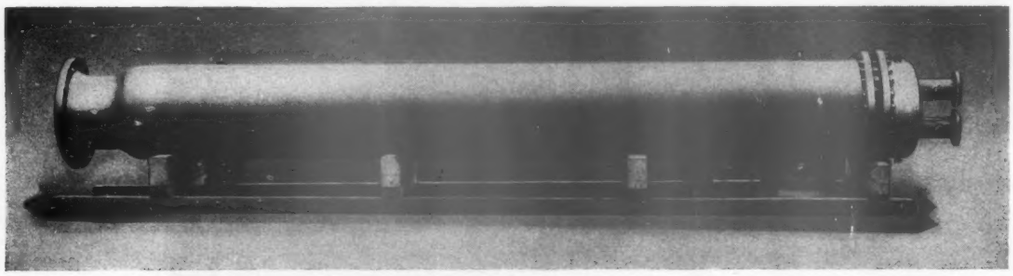

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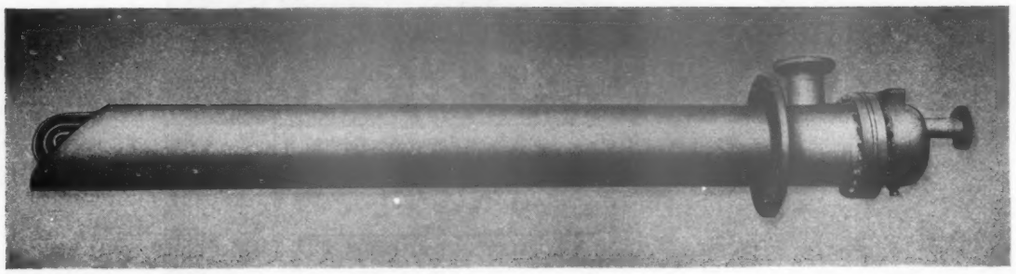

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AMERICAN LOCOMOTIVE COMPANY
ALCO PRODUCTS DIVISION
30 CHURCH ST., NEW YORK, N. Y. **DUNKIRK, N. Y.**

Survey of Natural Gasoline Plants in the United States

May 1, 1942

ARKANSAS

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Arkla Oil Co., Dallas, Tex., 11-20-28	A	40,000	.....
Carter Oil Co., El Dorado, El Dorado	A-C	10,000	.....
Magnolia Petroleum Co., Kenova, Union County	A	8,000	.....
Shell Oil Co., Inc., Magnolia,* NE NW 23-17s-20w	C-A	35,000	20,000
Sklar, Sam, Trustee, R. D. Reserve, El Dorado	C	3,500	.....
Sklar, Sam, Trustee, Pratt, El Dorado	C	4,400	.....
Sklar, Sam, Trustee, Rainbow, El Dorado	C	3,200	.....
Sklar, Armstrong	C	2,200	.....
Total		106,300	20,000

*Atlantic Refining Co. et al owns one-half interest.

CALIFORNIA

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Bankline Oil Co., Willow and Temple, Signal Hill	A	20,000	3,000
Barnsdall Oil Co., Elwood, 15-4n-29w	A	24,000	.....
Belridge Oil Co., McKittrick, Kern County	A	75,000	25,000
Belridge Oil Co., McKittrick, Kern County	A	75,000	.....
Brea Canyon Oil Co., Los Angeles, Brea-Olinda	A	14,000	.....
Coline Gasoline Corp., Torrance, Del Amo lease	A	25,000	3,000
Coline Gasoline Corp., Ventura, Rincon field	A	15,000	10,000
Cowan Oil & Refining Co., Belridge, Lost Hills field	A	30,000	.....
Cowan Oil & Gas Co., Rosecrans, Rosecrans	A	20,000	.....
Del Rey Oil & Gas Co., Venice, Playa Del Rey	C	30,000	.....
Del Valle Gasoline Co., Del Valle	A-C	20,000	10,000
Field, O. C., Gasoline Corp., Huntington Beach, Huntington Beach	A	50,000	5,000
Field, O. C., Gasoline Corp., Montebello, Montebello	A	40,000	12,000
General Petroleum Corp., Athens-Rosecrans, Athens-Rosecrans	A-C	40,000	.....
General Petroleum Corp., Santa Fe Springs, Santa Fe Springs	A	55,000	.....
General Petroleum Corp., Tonner, Tonner	A	10,000	.....
General Petroleum Corp., Ventura, Ventura	A	40,000	.....
General Petroleum Corp., Wilmington, Wilmington	A	60,000	.....
Gilmore Dabney, Inc., Long Beach, Signal Hill	A	30,000	.....
Honolulu Oil Corp., Taft, Buena Vista Hills	A	30,000	.....
Inglewood Gasoline Co., Culver City, Baldwin Hills	A	6,000	.....
Inglewood Gasoline Co., Inglewood, Potrero	A	15,000	.....
Lomita Gasoline Co., Signal Hill, Jergins lease	A	50,000	.....
Lomita Gasoline Co., Mountain View, Mountain View	A	20,000	.....
Los Nietos Producing & Refining Co., Avenal, Kettleman Hills	A	100,000	45,000
Norwalk Co., Maricopa, Midway-Sunset	A	6,000	5,000
Norwalk Co., Santa Fe Springs, Santa Fe Springs	A	20,000	1,500
Pacific Western Oil Corp., Los Angeles, Elwood	A	20,000	.....
Pacific Western Oil Corp., Los Angeles, Ventura	A	25,000	.....
Rice Ranch Oil Co., Santa Maria, Orcutt	A	3,200	.....
Richfield Oil Corp., Richfield-Western, Coles Levee	A	32,000	.....
Richfield Oil Corp., Crampton, Elk Hills	A	†5,000	.....
Richfield Oil Corp., El Segundo, El Segundo	A	12,000	.....
Richfield Oil Corp., Hobson, Rincon	A	*15,000	.....
Richfield Oil Corp., Huntington, Huntington Beach	A	*15,000	.....
Richfield Oil Corp., Signal Hill, Long Beach	A	25,000	.....
Shell Oil Co., Inc., Fullerton, Brea	A	20,000	.....
Shell Oil Co., Inc., Bicknell, Capitan	A	5,000	.....
Shell Oil Co., Inc., Compton, Dominguez	A	25,000	.....
Shell Oil Co., Inc., Long Beach, Long Beach	A	80,000	.....
Shell Oil Co., Inc., Bicknell, Santa Maria	A	2,500	.....
Shell Oil Co., Inc., Bakersfield, Ten Section	A	15,000	.....
Shell Oil Co., Inc., Ventura, Ventura	A	90,000	.....
Signal Oil & Gas Co., Goleta, Elwood Terrace	A	10,000	.....
Signal Oil & Gas Co., Huntington Beach, Huntington Beach	A	27,000	.....
Signal Oil & Gas Co., Long Beach, Signal Hill	A	30,000	.....
Signal Oil & Gas Co., Long Beach, Long Beach	A	15,000	.....
Standard Oil Co. of Calif., Coalinga, Coalinga	A	10,000	.....
Standard of California, Coles Levee, Coles Levee	A	12,000	.....
Standard of California, Greeley, Greeley	A	20,000	.....
Standard of California, Huntington Beach, Huntington Beach	A	35,000	15,000
Standard of California, Inglewood, Inglewood	A	25,000	.....
Standard of California, Kettleman Hills, Kettleman Hills	A	65,000	.....
Standard of California, Kettleman Hills, Kettleman Hills	A	120,000	100,000
Standard of California, Kettleman Hills, Kettleman Hills	A	100,000	.....
Standard of California, Long Beach, Long Beach	A	18,000	.....
Standard of California, Lost Hills, Lost Hills	A	4,000	.....
Standard of California, Mountain View, Mountain View	A	12,000	.....
Standard of California, Murphy-Coyote, Murphy-Coyote	A	40,000	.....
Standard of California, Santa Fe Springs, Santa Fe Springs	A	40,000	.....
Standard of California, Seal Beach, Seal Beach	A	25,000	.....
Standard of California, Taft, Taft	A	15,000	5,000
Standard of California, Taft, Taft	A	17,500	.....
Standard of California, Taft, Taft	A	10,000	.....
Standard of California, Torrance, Torrance	A	12,000	.....
Superior Oil Co., Kettleman Hills, Kettleman Hills	A	100,000	34,000
Superior Oil Co., Wagner plant, Rio Bravo	C	12,000	14,000
Texas Co., Huntington Beach, Orange County	A	20,000	.....
Texas Co., Montebello, Los Angeles County	C	40,000	.....
Texas Co., Santa Fe Springs, Los Angeles County	A	50,000	.....
Texas Co., Shiell's Canyon, Ventura County	A	35,000	.....
Texas Co., Signal Hill, Los Angeles County	A	75,000	.....
Texas Co., South Mountain, Ventura County	A	10,500	.....
Union Oil Co. of Calif., Brea-Olinda, Stearns	A	22,500	.....
Union Oil Co., Dominguez, Hellman lease	A	69,000	.....
Union Oil Co., Kettleman Hills, King lease	C	30,000	.....
Union Oil Co., Richfield, Morse lease	A	10,000	.....
Union Oil Co., Rio Bravo, Kernco 34 lease	A	15,000	.....
Union Oil Co., Rosecrans, Rosecrans	A	27,000	.....
Union Oil Co., Santa Fe Springs, Bell lease	A	70,000	.....
Union Oil Co., Santa Maria, Newlove lease	A	15,000	.....

ABBREVIATIONS

A	Absorption	Ch	Charcoal
C	Compression	V-R	Vapor Rectification
A-C	Absorption and Compression		
L.P.G.	Liquefied Petroleum Gas		

CALIFORNIA (Continued)

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Universal Consolidated Oil Co., Los Angeles, Rosecrans field	A	5,000	.....
West Coast Refining Co., Placentia, Richfield	A	50,000	.....
Western States Gasoline Corp., Avenal, Kettleman Hills	A	160,000	.....
Western States Gasoline Corp., Ventura, San Miguelito	A	15,000	.....
Wilmington Gasoline Co., Wilmington, Wilmington	A	30,000	20,000
Wilshire Oil Co., Santa Fe Springs, Santa Fe Springs	A	*50,000	.....
Total		2,905,700	307,500

*Shut down. †Operated as a vacuum compressor plant.

COLORADO

Mountain States Oil Corp., Trinchera, SW 3-34s-62w	A	6,000	.....

ILLINOIS

Arkansas Fuel Oil Co., Robinson, Sec. 3, Prairie Twp.	C	500	.....
Brenneman & MacDonell, Oblong, NE NE 6-6-13	C	1,000	.....
Brenneman & MacDonell, Oblong, NW SE 7-7-13	C	200	.....
Carter Oil Co., St. Elmo, Louden	A	40,000	.....
Ohio Oil Co., Robinson, Crawford County	T	10,000	4,514
Sunflower Gasoline Corp., Salem, Salem	A	125,000	62,500
Sunflower Gasoline Corp., Salem, Salem	A	40,000	20,000
Texas Co., Salem, Marion County	A	73,500	.....
Vacuum Gasoline Co., Bridgeport, 4 mi. SE Bridgeport	C	2,000	.....
Vacuum Gasoline Co., Bridgeport, 6 mi. NW Bridgeport	C	4,000	.....
Warren Petroleum Corp., Crossville, White & Posey Co.	A	Under construction	
Warren Petroleum Corp., Salem, Marion County	A	60,000	55,000
Total		356,200	142,014

KANSAS

Aldon Gasoline Co., Haven, Haven	A	10,000	10,000
Barnsdall Oil Co., Oxford, W½ NW 20-33s-3e	A	8,000	1,000
Cities Service Oil Co., Arkansas City, SE 13-34s-3e	A	15,000	.....
Cities Service Oil Co., Burrton, W½ 25-23s-4w	A	35,000	.....
Cities Service Oil Co., Haven, SE 17-24s-4w	A	25,000	.....
Cities Service Oil Co., Wichita, NW 17-28s-1e	A	50,000	.....
Kansas Power & Light Co., Topeka, Medicine Lodge	A	10,000	.....
Kansas Power & Light Co., Topeka, McPherson	A	10,000	.....
Northern Natural Gas Co., Hugoton, Hugoton	A	25,000	.....
Panhandle Eastern Pipe Line Co., Liberal, Liberal	A	100,000	.....
Skelly Oil Co., Cunningham, NE 30-27s-10w	A	40,000	15,000
Texas Co., Atlanta, Cowley County	A	6,300	.....
Warren Petroleum Corp., Galva, McPherson County	A	15,000	10,000
Total		349,300	36,000

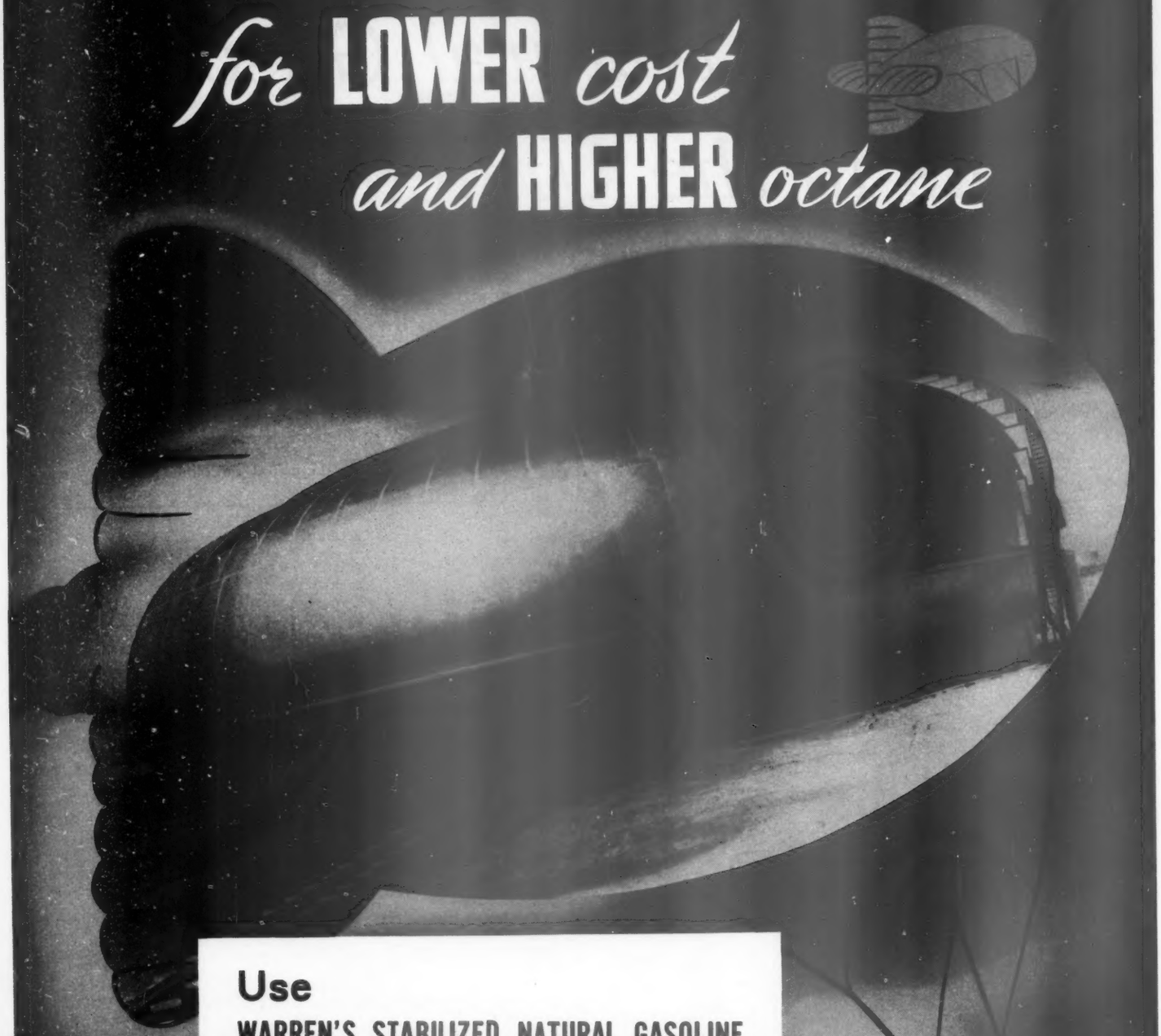
KENTUCKY

Kentucky-West Virginia Gas Co., Ashland, Ky.	Ch	Under construction	
Virginia Gasoline & Oil Co., Catlettsburg, Boyd County	A	40,000	.....
Virginian Gasoline & Oil Co., Kermit, W. Va., Martin Co.	A	10,000	7,000
Total		50,000	7,000

LOUISIANA

Anchor Gasoline Corp., Eola, Eola	A	20,000	10,000
Arkansas Fuel Oil Co., Haughton, 7-17n-11w	A	16,000	.....
Arkansas Fuel Oil Co., Homer, 24-21n-8w	C	5,000	.....
Arkansas Fuel Oil Co., Rodessa, 26-23n-16w	A	25,000	600
Arkansas Fuel Oil Co., Shreveport, 34-18n-14w	A	15,000	.....
Arkansas Fuel Oil Co., Sibley, 36-17n-10w	A	20,000	.....
Arkansas Fuel Oil Co., Simsboro, 3-18n-4w	A	15,000	.....
Arkla Oil Co., Capps Plant, Rodessa	A	30,000	.....
Carter Oil Co., Caddo Parish, Caddo	A-C	10,000	.....
Carter Oil Co., Claiborne Parish, Homer	C	10,000	.....
Coltexo Corp., Rodessa, Caddo Parish	A	40,000	.....
Continental Oil Co., Basile, NW 28-7s-2w	A	20,000	5,000
Continental Oil Co., Lake Charles, SW 14-9s-8w	A	20,000	.....
Continental Oil Co., Ville Platte, Evangeline Parish	A	75,000	60,000
Glen Rose Gasoline Co., Rodessa, Rodessa	A	25,000	6,000
Great National Oil Corp. of La., Ida, Ida	A	20,000	.....
Gulf Refining Co., Mooringsport, 19-21-7, Claiborne Par.	A	15,000	.....

for LOWER *cost and* HIGHER *octane*



Use

WARREN'S STABILIZED NATURAL GASOLINE

Insure your refining operations of two distinct advantages—an improved product and a lower cost of production. Both are in line with the national victory program—economy in manufacturing costs, greater service value for the customer.

Warren's dependable production, storage and shipping facilities give refiners a constant supply and a consistent quality of Stabilized Natural Gasoline for blending purposes. Why not enjoy these benefits yourself?

WARREN PETROLEUM CORPORATION

Manufacturers, Exporters and Marketers of Natural Gasoline

Tulsa, Oklahoma

Export Terminals: Corpus Christi, Port Arthur and Norsworthy, Houston, Texas, Lake Charles, La., and Marcus Hook, Pa.

LOUISIANA (Continued)

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Gulf Refining Co., Mooringsport, 19-20-5, Caddo Parish	A	8,000	.....
Ohio Oil Co., Cotton Valley, Webster Parish	A	7,740	2,400
Ohio Oil Co., Haynesville, Claiborne Parish	A	2,680	.....
Ohio Oil Co., Haynesville, Claiborne Parish	A	4,005	.....
Shell Oil Co., Inc., Iowa, NW 18-9s-6w	C-A	15,000	.....
Skelly Oil Co., Rodessa, 23-23n-16w	A	6,000	1,000
Stanolind Oil & Gas Co., Gilliam, Pine Island	A	3,000	.....
Texas Co., Lafitte, Jefferson Parish	A	10,350	.....
United Gas Pipe Line Co., Cotton Valley, 17-21n-10w	A	20,000	.....
United Gas Pipe Line Co., Koran, 31-17n-10w	A	18,000	.....
United Gas Pipe Line Co., Rodessa, 14-21n-15w	A	140,000	.....
United Gas Pipe Line Co., 6-19n-5w	A	20,000	.....
Total		635,775	85,000

MICHIGAN

Grimes, Otha H., Mount Pleasant, Greendale	A-C	5,000	.....
Grimes, Otha H., Temple	A-C	10,000	.....
Total		15,000	.....

MONTANA

Glacier Production Co., Cut Bank, Cut Bank	A	18,000	9,000

NEW MEXICO

El Paso Natural Gas Co., Jal, Lea County	A	50,000	25,000
El Paso Natural Gas Co.-Phillips Pet., Jal, Lea County	A	75,000	15,000
Phillips Petroleum Co., Eunice, NE 5-21-36	A	77,000	.....
Phillips Petroleum Co., Hobbs, N½ NW 4-19-38	A	40,000	.....
Phillips Petroleum Co., Lea, SW SE 30-17-35	A	37,000	.....
Shell Oil Co., Inc., Hobbs, SE 19-18s-38e	C-A	25,000	.....
Skelly Oil Co., Eunice, N½ SW 27-22s-37e	A	30,000	5,000
Warren Petroleum Corp., Monument, 36-19s-36e	A	30,000	15,000
Total		364,000	60,000

†Owned jointly by United Gas Pipe Line Co., Sugar Creek Syndicate, Inc., and Carter Oil Co. United Gas Pipe Line Co. operates plant for joint account.

OHIO

Hope Construction & Refining Co., New Matamoras, Appalachian	A	1,200	.....
Ohio Producing & Refining Co., Easton, Wayne County	A	6,000	.....
Preston Oil Co., Elk, Noble County	A	2,000	.....
Preston Oil Co., Homer, Licking County	A	15,000	.....
Preston Oil Co., Pavonia, Richland County	A	10,000	.....
Preston Oil Co., Sugar Groce, Fairfield County	A	9,000	.....
Preston Oil Co., York, Medina County	A	5,000	.....
Total		48,000	.....

OKLAHOMA

Bartlett Gasoline Co., Butler, Butler	A	15,000	12,000
Barnsdall Oil Co., Avant, SW NW SE 18-23n-12e	A	3,000	200
Barnsdall Oil Co., Earlsboro, NE NE 15-9n-5e	A	45,000	20,000
Barnsdall Oil Co., Turley, SE 5-20n-12e	A	2,000	.....
Carter Oil Co., Fittstown, Fitts	A	45,000	.....
Carter Oil Co., Seminole, Seminole	A	60,000	.....
Cimarron Gasoline Corp., Coyle, 4 mi. E of Coyle	A	15,000	8,000
Cities Service Oil Co., Asher, NE 22-6n-3e	A	7,500	.....
Cities Service Oil Co., Holdenville, SE 7-6n-8e	A-C	25,000	.....
Cities Service Oil Co., Konawa, NW 9-6n-6e	A	12,000	.....
Cities Service Oil Co., Oklahoma City, SE 24-11n-3w	A	20,000	.....
Cities Service Oil Co., Oklahoma City, NW 31-11n-2w	A	20,000	.....
Cities Service Oil Co., Oklahoma City, SE 11-11n-3w	A	20,000	.....
Cities Service Oil Co., Seminole, SE 24-9n-6e	A	25,000	.....
Cities Service Oil Co., Seminole, SW 14-8n-6e	A-C	25,000	.....
Cities Service Oil Co., Seminole, NE 11-8n-5e	C	9,000	.....
Cities Service Oil Co., Tallant, SE 35-25n-10e	A	20,000	.....
Cities Service Oil Co., Wewoka, NW 19-7n-8e	C	6,000	.....
Continental Oil Co., Billings, SE NW 21-23n-2w	A	20,000	5,000
Crosbie, Inc., J. E., Fittstown, Pontotoc County	A	25,000	5,000
Devonian Oil Co., Kellyville, 22-17n-10e	A	20,000	6,000
Eason Oil Co., Enid, 34-17n-4w	A	18,000	15,000
Frame Natural Gasoline Co., Cleveland, 35-21n-8e	C	3,000	.....
Frame Natural Gasoline Co., Cleveland, 19-21n-8e	A	1,700	.....
Grimes, Chas. W., & Otha H., Okemah, Okemah	A	3,000	.....
Grimes, Chas. W., & Otha H., Weleetka, Weleetka	A	7,500	2,000
Grimes, Otha H., Wetumba, Wetumka	A-C	3,500	.....
Grimes, Otha H., & Roy O. Neal, Drumright, 17-17n-7e	A	4,300	.....
Gulf Oil Corp., Tulsa, 1-21n-7e	C	1,500	.....
Gulf Oil Corp., Tulsa, 24-27n-5e	A	10,000	.....
Gulf Oil Corp., Tulsa, 16-17n-12e	S	18,000	.....
Gulf Oil Corp., Tulsa, 14-7n-6e	A	13,000	.....
Gulf Oil Corp., Tulsa, 7-8n-6e	A	23,000	.....
Knox Refining Co., Garber, Garber field	C	2,000	.....
Lone Star Gas Co., Hollis, Hollis	A	12,000	.....
Magnolia Petroleum Co., Ollton, Creek County	A	9,500	.....
Magnolia Petroleum Co., Graham, Carter County	A	5,000	.....
Magnolia Petroleum Co., Davenport, Lincoln County	A	3,700	.....
Magnolia Petroleum Co., St. Louis, Pottawatomie County	A	13,000	.....
Magnolia Petroleum Co., Stonewall, Pontotoc County	A	30,000	.....
Mid-Continent Pet. Corp., Bristow, SE SE 22-17-7	A	20,000	.....
Mid-Continent Pet. Corp., E½ NW 5-16-15	C	2,500	.....
Mid-Continent Pet. Corp., Morris, SW 12-13-13	A	2,500	.....
Mid-Continent Pet. Corp., Cromwell, NE SW 15-10-8	A	25,000	.....
Mid-Continent Pet. Corp., Stillwater, NE 13-18-1	A	10,000	.....
Neal Gasoline Co., Osage, 13-21n-8e	A	4,900	.....
Oklahoma Gasoline Plants, Inc., Drumright, NE 18-18n-7e	A	10,000	5,000
Oklahoma Utilities Co., Bristow, 20-16n-9e	A	5,000	.....
Peppers Gasoline Co., Oklahoma City, Oklahoma City	A	10,000	.....
Peppers Gasoline Co., Oklahoma City, Oklahoma City	A	30,000	.....
Phillips Petroleum Co., Edmond, W½ SE 31-14n-3w	A	40,000	.....
Phillips Petroleum Co., Dill, SE SE 2-11n-8e	A	25,000	.....
Phillips Petroleum Co., Denoya, NE NE 28-27n-5e	A	45,000	.....
Phillips Petroleum Co., Eleven-Eleven, SE NW 24-11n-11e	A	10,000	.....
Phillips Petroleum Co., Lima, NW NW 23-7n-6e	A	30,000	.....
Phillips Petroleum Co., Oklahoma City, S½ 1-11n-3w	A	200,000	.....
Phillips Petroleum Co., Reserve, SE 16-24n-7e	A-C	35,000	.....
Phillips Petroleum Co., Wetumka, N½ NW 3-9n-9e	A	20,000	.....
Phillips Petroleum Co., Wewoka, SW NW 33-8n-8e	A	30,000	.....
Powers, M. F., Depew, 8-15n-8e	A	3,500	500
Pure Oil Co., Drumright No. 1, Drumright	C	9,900	.....
Pure Oil Co., Seminole No. 15, Seminole	C	19,300	.....
Shell Oil Co., Inc., E. Cromwell, NW 35-11n-8e	A	25,000	.....
Shell Oil Co., Inc., Orlando,‡ SW 17-20n-2w	A	36,000	8,000
Shell Oil Co., Inc., E. Stroud, NW SW 32-15n-7e	C	3,000	.....
Shell Oil Co., Inc., Tonkawa,† SW 21-29n-1w	A	6,000	.....
Shell Oil Co., Inc., Tonkawa,† NE 2-24n-1w	A	10,000	.....
Shell Oil Co., Inc., Wilson, NE 8-4s-3w	A	12,000	.....

OKLAHOMA (Continued)

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Shell Oil Co., Inc., Wilson,* SW 22-4s-2w	A	16,000	.....
Shell Oil Co., Inc., Wolco, E½ 24-24n-11e	A	10,000	.....
Sinclair Prairie Oil Co., R.F.D. 1, Covington, 19-22n-3w	A	15,000	2,000
Sinclair Prairie Oil Co., R.F.D. 1, Drumright, 28-18n-7e	A	25,000	.....
Sinclair Prairie Oil Co., R.F.D. 8, Okla. City, 30-11n-2w	A	36,000	.....
Sinclair Prairie Oil Co., St. Louis, 27-7n-4e	A-C	80,000	.....
Sinclair Prairie Oil Co., Seminole, 35-9n-6e	A	50,000	.....
Sinclair Prairie Oil Co., R.F.D. 2, Seminole, 10-8n-6e	A	50,000	42,600
Sinclair Prairie Oil Co., Shidler, 29-27n-6e	A	15,000	4,900
Skelly Oil Co., Fairfax No. 1-2, NW 10-26n-6e	A	§70,000	.....
Skelly Oil Co., Lyman, SW 23-27n-5e	C	15,000	50,000
Skelly Oil Co., Naphtha No. 102, NW 9-26n-6e	A	§50,000	.....
Skelly Oil Co., Wynona, SW 24-24n-9e	A	3,000	.....
Texas Co., Blackbird, Osage County	A	3,680	.....
Texas Co., Davenport, Lincoln County	A	9,240	.....
Texas Co., Z. Moore, Creek County	C-A	15,945	.....
Victor Gasoline Co., Bristow, 27-16n-9e	A	4,000	400
Victor Gasoline Co., Stroud, 1-15n-6e	A	2,500	250
Warren Petroleum Corp., Aylesworth, Marshall County	A	25,000	24,000
Warren Petroleum Corp., Graham, Carter County	A	15,000	5,000
Warren Petroleum Corp., Maud, Pottawatomie County	A	30,000	15,000
Wright, Rosa B, Kellyville, 24-17n-10e	A	5,000	.....
Yale Gasoline Co., NE 13-19n-5e	A-C	1,500	.....
Total		1,868,665	180,850

*Partnership with Carter Oil Co. †Partnership with Continental Oil Co. ‡Partnership with seven companies. §Raw make processed at the Lyman plant.

PENNSYLVANIA

Alum Rock Gas Co., Port Allegany, Fern, Clarion County	C	500	.....
Bayliss & Bayliss, Titusville, 2 mi. S Titusville	C	10,000	.....
Carpenter, M. A., Karns City, Fairview Township	A	200	.....
Carnegie Natural Gas Co., Lone Pine, Washington Co.	A	1,000	.....
Clinger Oil & Gas Co., Tidioute, Fagundus	C	1,000	.....
Clinger Oil & Gas Co., Tidioute, Hastings	C	1,000	.....
Cochran, John G., & Co., Sheffield, Lot 438, Sheffield Township	A	*1,100	.....
Columbia Gas & Electric Corp., Kane, Kane	A	*7,000	.....
Columbia Gas & Electric Corp., W. Finley, West Finley	A	5,000	.....
Columbia Gas & Electric Corp., Majorsville, W. Va., Majorsville	A	10,000	.....
Columbia Gas & Electric Corp., Waynesburg, Waynesburg	A	*10,000	.....
Cook Oil Lease, Mayburg, Mayburg	C	150	.....
Crawford & Gregory, Emienton, 6 mi. N Fryburg	C	500	.....
Dempseytown Gas Co., Port Allegany, Clarion County	C	1,000	.....
Edwards, E. A., Titusville, Titusville	C	170	.....
Ellenburger, W. J., & Sons, Karns City, Karns City	C	300	.....
Elliott Brothers, Chicora, Chicora	C	500	.....
Equitable Gas Co., Clarksburg, Washington County	A	2,000	.....
Equitable Gas Co., Rogersville, Greene County	A	10,000	.....
Fleming, J. E., Grand Valley, Grand Valley	C	100	.....
Forest Chemical Co., Sheffield, Sheffield Township	A	*300	.....
Harvey, John J., estate, Titusville, Pleasantville	A	500	.....
Haskell, Roth & Bayliss, Tidioute, Warren County	C	10,000	.....
Hickey & Russell, Henry's Mills, Menry's Mills	C	300	.....
Hope Construction & Refining Co., Brave, Appalachian	A	25,000	.....
Hope Construction & Refining Co., Imperial, Appalachian	Ch	3,600	.....
Jennings, E. H., Bros. Co., Pittsburgh, Oakdale (3 plants)	C	1,500	.....
Kapp & Brochlehurst, Tidioute, Tidioute	V	100	.....
Mars Co., Hickory plant, Forest County	A	*1,500	.....
Mars Co., Lewis Run plant, Lewis Run	A	6,500	.....
Mars Co., Miola plant, Clarion County	A	*1,800	.....
Mars Co., Pinegrove plant, Venango County	A	4,000	.....
Mars Co., Van, Van	A	7,500	2,000
Moore, Way & Harrison, Titusville, Titusville	C	100	.....
Pennsylvania Oil Co., Sheffield, Warren County	A	10,000	.....
Pittsburgh Oil & Gas Co., Pittsburgh, Clarion	C	150	.....
Pittsburgh Oil & Gas Co., Pittsburgh, Miola	C	150	.....
Red Brush Oil Co., Tidioute, near Tionesta	C	300	.....
Sand Hill Lease, Tidioute, Tidioute	C	100	.....
Sloan & Zook Co., Kane, Kane	A	1,000	950
South Penn Oil Co., Pittsburgh, Kane	C	100	.....
South Penn Oil Co., Pittsburgh, President	C	500	.....
South Penn Oil Co., Pittsburgh, South Heights	C	550	.....
South Penn Oil Co., Pittsburgh, Bradford	C	550	.....
South Penn Oil Co., Pittsburgh, Chicora	C	150	.....
South Uenn Oil Co., Pittsburgh, Parker	C	100	.....
South Penn Oil Co., Pittsburgh, New Freeport	A	1,000	.....
South Penn Oil Co., Pittsburgh, Guffey	C	*150	.....
South Penn Oil Co., Pittsburgh, Washington	C	100	.....
South Penn Oil Co., Pittsburgh, Taylorstown	C	100	.....
South Penn Oil Co., Pittsburgh, Evans City	C	150	.....
South Penn Oil Co., Pittsburgh, Pleasantville	C	300	.....
South Penn Oil Co., Pittsburgh, Porcupine	C	650	.....
South Penn Oil Co., Pittsburgh, Pleasantville	C	*100	.....
South Penn Oil Co., Pittsburgh, Sturgeon	C	1,500	.....
South Penn Oil Co., Pittsburgh, Tiona	C	450	.....
South Penn Oil Co., Pittsburgh, Henry's Mills	C	300	.....
South Penn Oil Co., Pittsburgh, Hooker	C	100	.....
South Penn Oil Co., Pittsburgh, Noblestown (2 plants)	C	1,725	.....
Surety Oil Co., Titusville, Titusville	C	1,000	.....
Thomas, R. L., Tidioute, Middle field	C	150	.....
Tompsett Bros., Tidioute, Tidioute	C	200	.....
Triangle Co., Coraopolis, Coraopolis	C	100	1,600
Triumph Petroleum Co., Tidioute, Tidioute field	C	150	.....
Wahl, A. R., Evans City, Butler County	C	150	.....
Warner-Caldwell Oil Co., Titusville, Titusville	C	1,000	.....
Total		147,245	4,550

*Shut down.

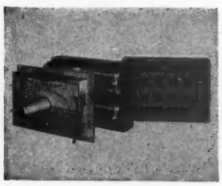
TEXAS

Agua Dulce Co., Robstown, Banquette	A	45,000	.....
American Republics Corp., Houston, Joe's Lake	A	8,000	.....
Anzac Oil Corp., Coleman County, Overall field	C	500	.....
Arab Gasoline Corp., Hise plant, 5 mi. N Eastland	A	20,000	.....
Arkansas Fuel Oil Co., Jefferson, Marion County	A	38,000	1,200
Arkansas Fuel Oil Co., Jefferson, Marion County	A	*11,000	.....
Arkansas Fuel Oil Co., Longview, Smith lease, Marion County	A	40,000	.....
Arkansas Fuel Oil Co., Waskom, Abney lease, Harrison County	A	24,000	.....
B-W Gasoline Co., Angleton, Angleton field	A	10,000	5,000
Bell Oil & Gas Co., Burkburnett, Burkburnett	C	5,000	.....
Barnsdall Oil Co., Odessa, SW 18-42-2s	A	25,000	8,000
Big Lake Oil Co., Texon 2-2, Reagan County	A	50,000	.....
Cabot Carbon Co., Wickett, S½ NE Sec. 3, Blk. 16, Ward County	C	35,000	.....
Cabot Carbon Co., Kermit, S½ NE Sec. 3, Blk. B-3, Winkler County	A	15,000	.....
Cabot Carbon Co., Kermit, Winkler County (Walton)	A	40,000	.....

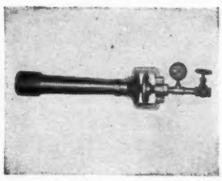
Webster Series R. Combination Gas and Oil Burner.

Webster Series 200, Radiant Gas or Combination Burner.

Webster Series 900, premixing Gas Burner.



Webster Radiant, low pressure, Gas Burner.



Webster Series VI, premixing Gas Burner.

Consulting Engineers and Manufacturers of Gas Combustion and Control Equipment....

More than 15 years experience in designing and building combustion equipment for natural gasoline plants and refineries, enables us to recommend the proper equipment for these installations. Our manufacturing facilities permit us to furnish this equipment on schedule.

Webster engineers are thoroughly capable of helping you solve your combustion problems and to design special equipment to meet special conditions.

THE WEBSTER ENGINEERING COMPANY

Division of SURFACE COMBUSTION - - - - - TOLEDO, OHIO

TULSA, OKLAHOMA

Eastern and Export Representatives:
Oil Field Equipment Co.
30 Church Street, New York, N. Y.

West Coast Representatives:
The Natural Gas Equipment Co.
San Francisco and Los Angeles

TEXAS (Continued)

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Canadian River Gas Co., Channing, Moore County	A	30,000	.....
Cities Service Oil Co., Odessa, SE 34-43-T.&P., Ector County	A	35,000	.....
Cities Service Oil Co., Pampa, N½ 136-3-I.&G.N., Gray County	A	30,000	.....
Clymore Co., Inc., Refugio, Refugio	A	30,000	2,000
Coltexo Corp., Lefors, Gray County	A	40,000	.....
Columbian Gasoline Corp., Shamrock, Wheeler County	A	12,000	.....
Consolidated Gasoline Co., Eastland, Eastland	A	15,000	.....
Continental Oil Co., Electra, K.M.A., Wichita County			
Main, Sec. 11, A-387	C		
Aux. 1, Sur. A-257 Spillers	C	70,000	40,000
Aux. 2, Blk. 18, A-255	C		
Danciger Oil & Refining Co., Brazoria County	A	40,000	6,000
Danciger Oil & Refining Co., Lefors, 2 mi. W of Lefors, Gray County	A	20,000	.....
Deep Oil Development Co., Wichita Falls, 6 mi. N Archer City	C	4,000	.....
Deep Oil Development Co., Wichita Falls, 1 mi. N Kamay	C	4,800	.....
Del Ray Petroleum Co., Hardin, Hardin	A	10,000	5,000
Desdemona Gasoline Co., Desdemona, Desdemona	A	3,000	.....
Duval Gasoline Co., Benavides, Benavides	C	16,000	4,000
General American Oil Co., Dallas, Gladewater	C	5,900	.....
Gregg-Tex Gasoline Corp., Longview, Longview	C	150,000	85,000
Gulf Refining Co., Monahans, Ward	A	30,000	.....
Gulf Refining Co., Overton, Overton	C	15,000	.....
Hagy, Harrington & Marsh, White Deer, Carson-Gray counties	A	75,000	50,000
Hammon Exploration Co., Bay City, Hamman field	A	10,000	905
Hanlon Gasoline Co., Breckenridge, Breckenridge	A	50,000	.....
Hanlon Gasoline Corp. of Texas, Gladewater, Gladewater	C-A	150,000	.....
Harper Trust Co., Bryson, Jack County	A	1,000	.....
Frank C. Henderson Trust No. 2, Sanford, Panhandle field	A	40,000	.....
Hercules Gasoline Co., Inc., Kilgore, Kilgore	C-A	60,000	40,000
Highlander Gasoline Co., Nocona, Rogers & Rogers field	A	2,000	.....
Huber, J. M., Corp., Borger, Borger	A	30,000	.....
Humble Oil & Refining Co., Bloomington, 3 mi. SE of Bloomington	A	11,000	.....
Humble Oil & Refining Co., Conroe, 5½ mi. SE of Conroe	C-A	18,000	.....
Humble Oil & Refining Co., Corpus Christi, 12 mi. SE of Corpus Christi	C-A	14,000	.....
Humble Oil & Refining Co., Dickinson, 2½ mi. E of Dickinson	A	11,000	.....
Humble Oil & Refining Co., Overton, 4 mi. NE of Overton	V-R	31,000	.....
Humble Oil & Refining Co., Overton, 2½ mi. SE of Kilgore	C-A	28,000	.....
Humble Oil & Refining Co., Overton, 3 mi. SE of Overton	C-A	40,000	68,000
Humble Oil & Refining Co., Tomball, 2 mi. SW of Tomball	C-A	22,000	.....
Knox Refining Co., Knox, 8 mi. NE Graham	C	2,500	.....
Lesh & McCall, Wichita Falls, ½ mi. NW Nacona	A	5,000	.....
Lisbon Gasoline Co., Henderson, Brown Survey, Rusk County	A	50,000	.....
Lone Star Gas Co., Gordon, 2 mi. E of Gordon	A	15,000	.....
Lone Star Gas Co., Petrolia, 3 mi. S of Petrolia	A	5,000	.....
Lone Star Gas Co., Pueblo, 7 mi. SE of Moran	A	5,000	.....
Lone Star Gas Co., Sipe Springs, 8 mi. from Rising Star	C	1,000	.....
Lone Star Gas Co., Trinidad, 2 mi. SE of Trinidad	A	30,000	.....
Lone Star Gasoline Co., Breckenridge, Breckenridge	A	30,000	.....
Lone Star Gasoline Co., Eastland, Eastland	A	6,000	.....
Lone Star Gasoline Co., Grapeland, 3 mi. NW Grapeland	A	100,000	.....
Lone Star Gasoline Co., Ranger (2), Ranger	A	30,000	.....
Magnolia Petroleum Co., Burkburnett, Wichita County	C	4,000	.....
Magnolia Petroleum Co., Desdemona, Eastland County	A	7,500	.....
Magnolia Petroleum Co., Electra, Wilbarger County	C	4,500	.....

TEXAS (Continued)

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Magnolia Petroleum Co., Kermit, Winkler County	A	18,000	.....
Magnolia Petroleum Co., Kings Mill, Gray County	A	9,000	.....
Magnolia Petroleum Co., Olden, Eastland County	A	9,000	.....
Magnolia Petroleum Co., Sunray, Moore County	A	20,000	.....
Manhattan Gasoline Co., Sinton, Sinton	A	25,000	.....
Mid-Co Gasoline Corp., Corsicana, Cayuga	A	10,000	.....
Midland Gasoline Co., Conroe, Conroe	A	30,000	20,000
Nash Gasoline Co., Graham, James field	A	3,000	.....
Natural Gasoline Corp., Aransas Pass, Aransas County	A	30,000	15,000
Nine Oaks Gasoline Corp., Gladewater, Gladewater	C	900	.....
Novice Gas Recycling Corp., Eastland, Novice	A	3,000	.....
Parade Co., The, Overton, Joiner area	C-A	125,000	50,000
Phillips Petroleum Co., Bowers, W½ 62-62, H.&G.N., Gray County	A	50,000	.....
Phillips Petroleum Co., Canadian, NW SE 1-X02, Hutchinson County	A	20,000	.....
Phillips Petroleum Co., Carson, 115-5 I.&G.N., Carson County	A	20,000	.....
Phillips Petroleum Co., Crane, NE NE 216-F, C.C.S.D.& R.G.N.G., Crane County	A	30,000	.....
Phillips Petroleum Co., Eliasville, N½ 1174-T.E.&L., Stephens County	A	12,000	.....
Phillips Petroleum Co., Frankell, SE SW 51-6-T.&P., Stephens County	A	8,500	.....
Phillips Petroleum Co., Goldsmith, SE 33-44-1n, T.&P. Ector County	A	60,000	.....
Phillips Petroleum Co., Gray, E½ 32-2-H.&G.N., Gray County	A	100,000	.....
Phillips Petroleum Co., Ibex, NW 28, B.A.L., Shackelford County	A	12,000	.....
Phillips Petroleum Co., Johnson, S½ 69-46-H.&T.C., Hutchinson County	A	50,000	.....
Phillips Petroleum Co., Judkins, N½ N½ 1-35-U.L., Ector County	A	40,000	.....
Phillips Petroleum Co., Lefors, NE NE 56-25-H.&G.N., Gray County	A	15,000	.....
Phillips Petroleum Co., Lodi, NE cor. Wm. R. Myers Sur., Cass County	A	40,000	.....
Phillips Petroleum Co., Mankins, Blk. 28, Chas. A. Mangold Subd., Lazuras Ranch, P. Castleman Sur., Wichita County	C-A	25,000	.....
Phillips Petroleum Co., North, SW 35-3-I.&G.N., Gray County	A	50,000	.....
Phillips Petroleum Co., Pampa, W½ SW 88-B2-H.& G.N., Gray County	A	60,000	.....
Phillips Petroleum Co., Panhandle, SW 113, 5-I.&G.N., Carson County	A	15,000	.....
Phillips Petroleum Co., Pantex, SW cor. Mary Whitely, Blk. 8, Hutchinson County	A	50,000	.....
Phillips Petroleum Co., Pioneer, W. A. Eaken Tr., Eastland County	A	15,000	.....
Phillips Petroleum Co., Ray, W½ 164-3-T-T.&N.O., Moore County	A	10,000	.....
Phillips Petroleum Co., Rock Creek, NW 22-Y-A.&B., Hutchinson County	A	60,000	.....
Phillips Petroleum Co., Sanford 81-46-H.&T.C., Hutchinson County	A	40,000	.....
Phillips Petroleum Co., South Bend, J. Garrett Sur A-108, Young County	A	9,000	.....
Phillips Petroleum Co., Texroy, SE 3-B3-D.&S.E., Hutchinson County	A	50,000	.....
Portland Gasoline Co., Pampa, 4 mi. from Pampa	C-A	30,000	.....
Pure Oil Co., Van, Van	C-A	34,000	5,000
Rhodes Pool Gasoline Co., Bryson, SE of Bryson	C	2,000	.....
Roeser & Pendleton, Inc., Albany, Bluff Creek	A	5,000	.....
Roeser & Pendleton, Inc., Albany, Cook field	A	30,000	.....
Rudco Oil & Gas Co., Desdemona, Desdemona	C	1,500	.....
Rudco Oil & Gas Co., Rising Star, Rising Star	C	1,500	.....
Sabine Valley Gasoline Co., Longview, Longview	V-R	60,000	40,000
Shamrock Oil & Gas Corp., Sunray, Sunray	A	57,000	90,000
Shell Oil Co., Inc., Denver City‡, NE 892-D, Yoakum County	C-A	60,000	.....
	A	15,000	.....

(Continued on Next Page)

SURVEY OF CONDENSATE-RECOVERY OPERATIONS

LOUISIANA

Company and plant address—	Field location	Daily gas capacity (in. thou. cu. ft.)	Daily production in barrels— Condensate	Motor fuel	Butane-propane	Other products
Cotton Valley Operators Committee, Cotton Valley	Cotton Valley, Webster County	150,000	10,000	.....	2,500	.....
Stanolind Oil & Gas Co., Jennings	South Jennings, Acadia Parish	40,000	.....	26,000	.....	10,000
Texas Co., New Orleans	Berwick, St. Mary Parish	.....	.....	.....	.....	.....
Texas Co., New Orleans	Mongoulois, St. Martin Parish	.....	.....	.....	.....	.....
TEXAS						
Abercrombie, J. S., Co., and Harrison Oil Co., Houston	Old Ocean, Brazoria County	200,000	.....	.....	.....	.....
Agua Dulce Co., Robstown	Agua Dulce, Nueces County	50,000	1,200	1,200	85	80
American Liberty Oil Co., Blessing	Blessing field, Matagorda County	28,000	650	.....	.....	.....
American Liberty Oil Co., Grapeland	Grapeland field, Houston County	55,000	1,500	.....	.....	.....
Anco Gas Corp., Dallas	Long Lake field, Anderson County	50,000	1,300	.....	.....	.....
Chicago Corp., Bishop	10 mi. S of Agua Dulce, Nueces Co.	120,000	3,100	.....	.....	.....
Chicago Corp., Robstown	6 mi. SW Banquette, Nueces County	120,000	2,200	.....	.....	.....
Davis, W. R., Co., Alice	East Alice field, Jim Wells County	100,000	2,700	.....	100	.....
Francitas Gas Co., Blessing	Francitas, Jackson County	60,000	2,500	.....	.....	.....
Gasoline Production Corp., Grapeland	Grapeland field, Houston County	60,000	2,000	.....	.....	80
Geier-Jackson Recycling Co., Grapeland	Grapeland field, Houston County	48,000	.....	1,240	360	60
Gulf Plains Corp., Bishop	7 mi. S Agua Dulce, Nueces County	125,000	2,900	.....	.....	.....
Harrell, H. M., Shreveport	Bammel field, Harris County	35,000	900	.....	.....	.....
Hunt Oil Co., Tucker	Long Lake field, Anderson County	50,000	1,285	950	255	80
Lockhart Oil Co. of Texas, Banquette	Agua Dulce field, Nueces County	50,000	1,250	950	100	250
La Gloria Corp., Falfurrias	Falfurrias, Jim Wells County	225,000	250	5,300	800	600
Lone Star Gasoline Co., Grapeland	3 mi. NW Grapeland, Houston Co.	80,000	.....	2,300	450	200
Lone Star Gasoline Co., Longview	3 mi. SW Longview, Gregg County	50,000	650	.....	.....	.....
Pewitt, P. H., Recycling Plant, Longview	Joaquin, Shelby County	15,000	50	.....	.....	.....
Roeser & Pendleton, Inc., Fort Worth	Cayuga field, Anderson County	8,486	70	.....	.....	.....
Shamrock Oil & Gas Corp., Athens	Opelika field, Henderson County	75,000	4,200	.....	450	.....
Stanolind Oil & Gas Co., Refugio	La Rosa	50,000	10,000	.....	2,500	25,000
Sun Oil Co., Beaumont	Seabreeze, Chambers County	18,000	.....	.....	.....	.....
Trinity Gas Corp., Dallas	Long Lake field, Anderson County	20,000	430	.....	.....	.....
Tide Water Associated and Seaboard, Palestine	Cayuga No. 1, Anderson County	28,000	800	.....	.....	.....
Tide Water Associated and Seaboard, Palestine	Cayuga No. 2, Anderson County	40,000	950	.....	.....	.....
Tide Water Associated and Seaboard, Palestine	Long Lake field, Anderson County	60,000	1,425	.....	.....	.....

TEXAS (Continued)

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Cannon Gasoline Co., Amarillo, No. Amarillo City	A	10,000	1,500
Shell Oil Co., Inc., Pampa, SW 83-3-I.&G.N.			
Shell Oil Co., Inc., Skellytown, SW 113-4-I.&G.N., Panhandle	A	5,000	.....
	A	25,000	.....
Shell Oil Co., Inc., Skellytown, SE 107-4-I.&G.N.	C-A	80,000	35,000
Sinclair Prairie Oil Co., Longview, J. Moseley Sur.	C-A	15,000	31,000
Sinclair Prairie Oil Co., Taft, G. W. Fulton Sur.	C-A	80,000	.....
Sinclair Prairie Oil Co., Troup, R. McAnulty Sur.			
Skelly Oil Co., Armstrong, NW Jos. W. Proctor Sur., Hutchinson County	A	15,000	5,000
	C	10,000	1,000
Skelly Oil Co., Burkburnett, Burkburnett Townsite			
Skelly Oil Co., Crawford, SE 124-4-I.&G.N., Carson County	A	‡30,000	.....
Skelly Oil Co., Kings Mill, NE NE 174-3-I.&G.N., Gray County	A	‡32,000	.....
	A	34,000	50,000
Skelly Oil Co., Shafer No. 1			
Skelly Oil Co., Watkins, NE 13-M21-T.C., Huchinson County	A	‡22,000	.....
Smith Brothers Refinery Co., Inc., Magic City, Magic City	A	15,000	.....
Smith Brothers Refinery Co., Inc., McLean, McLean	C-A	40,000	.....
Southern Coast Corp., Corpus Christi, Corpus Christi	A	6,000	.....
Southern Minerals Corp., Corpus Christi, Saxet field	A	60,000	.....
Standard Oil Co. of Texas, Royalty, Ward County	C-A	25,000	.....
Stanolind Oil & Gas Co., Bishop, Luby	A	30,000	2,500
St. Marys Oil & Gas Co., Moran, Callahan County	A	750	.....
Texas Co., Burkburnett, Wichita County	A	15,600	.....
Texas Co., Electra, Wichita County	C	16,450	.....
Texas Co., Johnson, Foard County	A	4,400	.....
Texas Pacific Coal & Oil Co., Caddo, 4 mi. NW of Caddo	C	15,000	8,000
Texas Pacific Coal & Oil Co., Eliasville, 4½ mi. SW of Eliasville	C	10,000	1,500
Texas Pacific Coal & Oil Co., Strawn, 4 mi. S of Strawn	C	10,000	.....
Texoma Natural Gas Co., Fritch, 5-Y2-T.T.R.R., Hutchinson County	A	85,000	.....
Texoma Natural Gas Co., Stinnett†, Moore County	A	18,000	.....
Tucker Oil Co., Wichita Falls, Blk. 83 R.R.V., Wichita County	C	2,000	.....
United Gas Pipe Line Co., Banquete, Agua Dulce field	A	45,000	.....
United Gas Pipe Line Co., Refugio, Refugio	A	25,000	.....

A few C-F Regulators representing a full line for all needs of PRESSURE CONTROL

Gas, oil, steam, water, air, at any pressure up to 2,000 pounds, can be controlled and handled at reduced pressures as desired, by use of the proper C-F Regulators. For all pressures up to 600 pounds, standard designs are suitable. For pressures above that limit special designs are adapted according to conditions of use. Please state your requirements and suggestions will be offered.

THE CHAPLIN-FULTON MFG. CO.

38 PENN AVE. PITTSBURGH, PA.

TEXAS (Continued)

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Waggoner, W. T., Estate, Vernon, 12 mi. S of Vernon	A	7,000	.....
Warren Petroleum Corp., Fairbanks, Harris County	A	15,000	10,000
West Texas Gas Co., Fritch, Fritch	A	15,000	.....
Woodley Petroleum Co., Baird, Callahan County	A	900	.....
Total		4,054,300	701,105

*Under construction.
†Coltexo Corp. owns half interest.
‡Raw-make processed at Schafer plant.

WEST VIRGINIA

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Blue Creek Oil & Gas Co., Charleston, Blue Creek	C	*3,500	.....
Carbide & Carbon Chemicals Corp., Diamond, Diamond	C	3,000	.....
Carbide & Carbon Chemicals Corp., Hastings, Hastings	C	2,000	.....
Carnegie Natural Gas Co., Hundred, Hundred	A	3,300	.....
Carnegie Natural Gas Co., Underwood, Underwood	A	3,000	.....
Carnegie Natural Gas Co., Pine Grove, Pine Grove	A	*3,000	.....
Carnegie Natural Gas Co., Toll Gate, Toll Gate	A	100	.....
Dinsmoor & Co., St. Marys, Sugar Creek, Shawnee, Henry Camp, Bills 10-Acre, Fetty, Roby, Brush Run and Pike plants	C	290	.....
Dun Mar Oil & Gas Co., Fairview, Jarke Run	C	400	.....
Falling Rock Cannel Coal Co., Falling Rock, Falling Rock	A	3,000	.....
Hapgood, Roswell T., & Co., Cedar Grove, Cedar Grove	A	6,500	.....
Henaghan & Hanlon, Inc., Sistersville, Big Knot	C	1,000	.....
Henaghan & Hanlon, Inc., Sistersville, Burns	C	800	.....
Henaghen & Hanlon, Inc., Sistersville, Hammee	C	2,000	.....
Henaghan & Hanlon, Inc., Sistersville, Harrisville	C	500	.....
Henaghan & Hanlon, Inc., Sistersville, Highland	C	800	.....
Henaghan & Hanlon, Inc., Sistersville, Murphy	C	300	.....
Henaghan & Hanlon, Inc., Sistersville, Nye	C	1,500	.....
Henaghan & Hanlon, Inc., Sistersville, Rock Run	C	600	.....
Hope Construction & Refining Co., Bristol, Appalachian	A	8,000	.....
Hope Construction & Refining Co., Cornwell, Appalachian	A	14,000	.....
Hope Construction & Refining Co., Mount Clair, Appalachian	A	2,500	.....
Hope Construction & Refining Co., Pine Grove, Appalachian	A	40,000	30,000
Hope Construction & Refining Co., Valley Chapel, Appalachian	A	20,000	.....
Hope Construction & Refining Co., Waverly, Appalachian	A	5,000	.....
Jennings, E. H., Bros. Co., Pittsburgh, Pa., Jacksonburg (2 plants)	C	1,500	.....
Melrose Oil & Gas Co., Sistersville, Gorrel Farm, Middlebourne	C	100	.....
Oil & Gas Co., Parkersburg, Ritchie County	C	250	.....
Owens, Libby-Owen Gas Dept., South Malden, South Malden	A	10,000	10,000
Pittsburgh Oil & Gas Co., Macfarian, Ritchie County	C	200	.....
Pittsburgh Oil & Gas Co., Middlebourne, Tyler County	C	50	.....
Pure Oil Co., Dawes, Dawes	C-A	8,200	.....
Reno Oil Co., Hannahdale, Ritchie County	C	46	.....
Reno Oil Co., Harrisville, Ritchie County	C	11	.....
Reno Oil Co., Harrisville, Ritchie County	C	81	.....
Reno Oil Co, Middlebourne, Tyler County	A	27	.....
Reno Oil Co., Middlebourne, Tyler County	C	57	.....
Reno Oil Co., Middlebourne, Tyler County	C	50	.....
Reno Oil Co., Sistersville, Tyler County	C	33	.....
South Penn Oil Co., Pittsburgh, Pa., Coco	C	2,200	.....
South Penn Oil Co., Pittsburgh, Pa., Glenville	C	1,100	.....
South Penn Oil Co., Pittsburgh, Pa., Liverpool	C	1,000	.....
South Penn Oil Co., Pittsburgh, Pa., Mannington	A	1,500	.....
South Penn Oil Co., Pittsburgh, Pa., Bula	C	200	.....
South Penn Oil Co., Pittsburgh, Pa., Aloy	C	1,400	.....
South Penn Oil Co., Pittsburgh, Pr., Bulls Mills	C	700	.....
South Penn Oil Co., Pittsburgh, Pa., Spencer	C	2,600	.....
South Penn Oil Co., Pittsburgh, Pa., Walton	C	2,400	.....
South Penn Oil Co., Pittsburgh, Pa., Fink	C	1,000	.....
South Penn Oil Co., Pittsburgh, Pa., Yawkey	C	3,000	.....
South Penn Oil Co., Pittsburgh, Pa., Macfarlan	C	2,000	.....
South Penn Oil Co., Pittsburgh, Pa., Wolf Summit	C	2,000	.....
South Penn Oil Co., Pittsburgh, Pa., Metz	C	1,500	.....
South Penn Oil Co., Pittsburgh, Pa., Smithfield	C	3,000	.....
South Penn Oil Co., Pittsburgh, Pa., Statler Run	C	2,200	.....
South Penn Oil Co., Pittsburgh, Pa., Pine Grove	C	2,500	.....
South Penn Oil Co., Pittsburgh, Pa., Ashley	C	250	.....
South Penn Oil Co., Pittsburgh, Pa., Clay Court House	C	2,200	.....
South Penn Oil Co., Pittsburgh, Pa., Shirley (2 plants)	C	1,600	.....
South Penn Oil Co., Pittsburgh, Pa., Shinnston	C	400	.....
South Penn Oil Co., Pittsburgh, Pa., Blue Creek (2 plants)	C	4,700	.....
Tyler Oil Co., Sistersville, Tyler County (3 plants)	C	110	.....
Union Gasoline & Oil Corp., Moundsville, Marshall County	A	3,000	.....
Union Gasoline & Oil Corp., Jane Lew, Lewis County	A	3,000	.....
Union Gasoline & Oil Corp., Porters Falls, Wetzel County	A	10,000	.....
Virginian Gasoline & Oil Co., Charleston, Kanawha County	Ch	*2,000	.....
Virginian Gasoline & Oil Co., Charleston, Kanawha County	A	15,000	.....
Virginian Gasoline & Oil Co., Clendenin, Kanawha County	A	40,000	6,000
Virginian Gasoline & Oil Co., Hubball, Lincoln County	Ch	12,000	.....
Virginian Gasoline & Oil Co., Jarretts Ford, Kanawha County	A	1,800	.....
Virginian Gasoline & Oil Co., Mammoth, Kanawha County	A	2,500	.....
Virginian Gasoline & Oil Co., Ona, Cabell County	A	18,000	.....
Virginian Gasoline & Oil Co., St. Albans, Kanawha County	Ch	3,500	.....
Virginian Gasoline & Oil Co., Sandyville, Jackson County	A	20,000	14,000
Virginian Gasoline & Oil Co., Spencer, Roane County	Ch	*12,000	.....
Virginian Gasoline & Oil Co., Three Mile, Kanawha County	A	3,500	.....
Virginian Gasoline & Oil Co., Walgrove, Kanawha County	A	*1,000	.....
Total		328,890	60,000

*Shut down.

WYOMING

Company, mailing address and plant location—	Type of plant	Daily cap. (gal.)	Dly. L.P.G. cap. (gal.)
Continental Oil Co., Lance Creek, SE 31-36n-65w	A	25,000	15,000
Northern Utilities Co., Riverton, Riverton	A	4,500	.....
Ohio Oil Co., Grass Creek, Hot Springs County	C	3,600	.....
Ohio Oil Co., Rocky River, Carbon County	A	5,000	.....
Ohio Oil Co., Rock River, Carbon County	A	5,000	2,000
Sinclair Wyoming Oil Co., Columbine, NE NE 13-39-79w	A	5,000	.....
Sinclair Wyoming Oil Co., Lost Soldier, 10-26n-90w	C	5,000	.....
Stanolind Oil & Gas Co., Midwest, Salt Creek	C	70,000	.....
Total		123,100	17,000

JOHN CRANE *packings*

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It's an old sales argument but it's a truism too: "quality is *cheapest* in the long run." . . . Today especially, when *long runs* are a "must order," quality dare not be sacrificed to economy—it may prove costly to equipment and dangerous to emergency production . . . John Crane Packings have won front-rank position throughout the petroleum world on their ability to withstand many times the maximum operating demand made upon them. This in-built "plus-value" pays out extra hours of service—long after "economy" packings have failed . . . The cost? A few pennies more. When you repack let our technical staff recommend a John Crane Packing.

EQUIPMENT: Centrifugal, reciprocating and rotary pumps.
SERVICE: Oils, distillates and solvents.
STYLE 1810 . . . *John Crane* BRAIDED ASBESTOS PETROLEUM-RESISTANT PACKING
SPECIFICATIONS: (Illustrated at top) . . . Made from finest Canadian asbestos yarns by plaited-braid method. The notable feature of this style is the special petroleum-resistant lubrication with which each strand is treated. A soft, resilient packing that reduces friction to a minimum.

*

EQUIPMENT: Centrifugal pumps handling propane, butane, gasoline light hydro-carbons, and
Reciprocating pumps handling light or heavy distillates,
TEMPERATURES TO 200° F.
STYLE 184 . . . *John Crane* PLASTIC PACKING
SPECIFICATIONS: (Illustrated at center) . . . Resilient plastic packing made from special long fibre asbestos, graphite and metallic particles; impregnated with a special lubricant insoluble in petroleum distillates.

*

EQUIPMENT: Gas Compressors.
STYLE . . . *John Crane* SEGMENTAL PISTON RINGS
SPECIFICATIONS: (Illustration shows Tensioned step-cut ring) . . . Cranelite is made from fine quality duck, laminated, and bound with synthetic resin. May be machined to any size. Especially recommended for piston rings, for packing gas compressors and for fluid-ends of reciprocating pumps. Cross-section shows new John Crane piston-head design and Cranelite rings.

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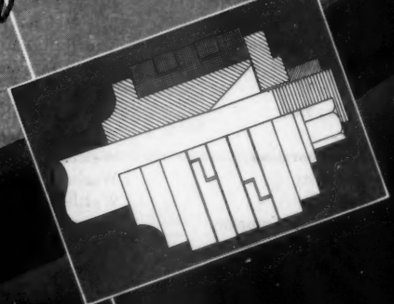
STYLE 184 . . . *Patented* "Spring-back" Resili

for GAS — ON COMPRESSORS
JOHN CRANE "CRANELITE" PISTON



Natural-Gasoline Plants Are Reflecting Influence of War

(Continued from Page 31)

ery are different but practical results in the three types of endeavor are becoming more closely associated.

The Journal's survey indicates that natural-gasoline plants have capacity for recovering approximately 3,330,000 gal. of liquefied petroleum gases daily. Nearly 50 per cent of the capacity is estimated and undistributed because of the reluctance of some producers to disclose capacities for this particular phase of operations. Another reason given is that the capacities are not necessarily an accurate reflection of operating conditions because the production can be varied from zero to 100 per cent, depending on methods of processing, flow arrangement and other physical adjustments.

PERCENTAGE DISTRIBUTION OF NATURAL-GASOLINE PRODUCTION

	February	
	1942	1941
Appalachian area	3.92	4.43
Illinois, Michigan, Kentucky	4.02	2.30
Oklahoma	12.32	14.86
Kansas	2.49	3.50
Texas	46.61	41.93
Louisiana	8.62	4.76
Arkansas	.96	1.32
Rocky Mountains	3.43	3.68
California	17.62	23.21

Production of isobutane and liquefied petroleum gases in January, according to the Bureau of Mines report, totaled 73,206,000 gal., a daily average of 2,361,500 gal. Output of the same products declined to a daily average of 2,170,000 gal. in February. This classification of light-fraction production is separated by the bureau reports for January and February from the same types of hydrocarbons produced from refinery gases.

"Recycle products," a classification set up by the Bureau of Mines for condensate recovered in high-pressure operations, amounted to 61,362,000 gal. in January and 54,684,000 gal. in February, averaging 47,130 and 46,500 bbl. daily, respectively.

Condensate-recovery plants, segregated from operations in which production of liquefied products is incidental to pressure maintenance, total 31, according to the Journal's survey. Twenty-seven of the condensate-recovery plants are in Texas and four are in Louisiana. Essentially, the results of condensate recovery and pressure maintenance operations are analogous. Residue gases in both types of operations are returned to producing formations. Objectively, however, the two types of operations are distinct and the basic differences lead to wide variations in the percentage of liquids recovered and the equipment required.

The phenominal increase of liquefied-petroleum-gas demand continued through 1941. Sales averaged 1,219,000 gal. daily, an increase of 42 per cent, according to estimates of G. G. Oberfell, vice president of Phillips Petroleum Co., as reported in The Oil and Gas Journal, January 15, 1942, Page 22. Domestic demand increased 65.5 per cent over 1940 to a daily average of 607,890 gal.

War Obscures Outlook

Prospects for future increases in the domestic demand for liquefied petroleum gases are clouded by refusal of the War Production Board to permit other than essential consumer installations, probably for duration of the war. Gains during the war period will be largely confined to the requirements for butanes, butenes and pentanes to supplement refinery production of similar fractions for conversion into aviation alkylate, butylene, butadiene and toluene. Requirements from industries engaged in producing war materials will be permitted to expand to whatever extent necessary. Several producers are concentrating on cultivation of industrial and miscellaneous markets and attempting to hold domestic consumption at a static level.

Records show that butane makes up approximately 25 per cent of the total requirements for liquefied petroleum gas. Nearly 40 per cent of the total sales consist of butane-propane mixtures; 34 per cent are propane and 1 per cent pentane. Conditions indicate that propane dominance of the domestic market for liquefied petroleum gas will be increased, probably for replacement of portions of the butane and pentane previously distributed in this field, which now may be diverted to more essential war products.

Significant changes have taken place during the past year in the productivity of various states, featuring substantial increases in Texas and Louisiana because of the growth of condensate-recovery operations. Normal declines continue in the Appalachian area and the percentage of Oklahoma production has dropped from 14.86 per cent of the total a year ago to 12.32 per cent last February. Texas produced 46.61 per cent of the nation's total of all condensate, natural gasoline and liquefied petroleum gas in February 1942, compared to 41.93 per cent of the February 1941 aggregate. This tends to confirm the assumption that little of the condensate and liquefied-petroleum-gas production appeared in Bureau of Mines production reports prior to January 1942. California is credited with producing 17.62 per cent of the national output last February, a decline of 5.59 per cent compared to the percentage of 23.21 a year earlier.

TO ALL

Natural Gasoline Men

Greetings

FROM THE

NATURAL GASOLINE SUPPLY MEN'S ASSOCIATION

We are looking forward to seeing you at the

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of the

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Chicago Bridge & Iron Company
Clark Brothers Company
Continental Supply Company
Cooper-Bessemer Corporation
Joseph A. Coy Company
W. H. Curtin & Company
The Fisher Governor Company
The Foxboro Company
Frick-Reid Supply Corporation
Gasoline Plant Construction Corporation
Goulds Pumps, Inc.
D. W. Haering & Co., Inc.
Hanlon-Waters, Inc.
Hercules Motors Corporation
Ingersoll-Rand Company
Warner Lewis Company
Mason-Neilan Regulator Company
C. A. Mathey Machine Works
Mid-Continent Engineering Company
Merco Nordstrom Valve Company
Metric Metal Works
Midwest Piping & Supply Company
Moorlane Company
National Petroleum News
National Tank Company
Naylor Pipe Company
The Oil and Gas Journal
The Petroleum Engineer
Petroleum Engineering, Inc.
Pittsburgh Equitable Meter Company
The Refiner & Natural Gasoline Manufacturer
The Refinery Supply Company
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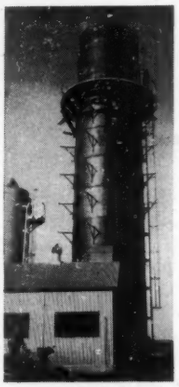

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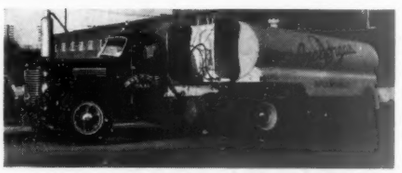

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Refinery Expansion

WPB Halts Use of Preference Orders For Increasing Stocks of Fuel Oils

WASHINGTON, D. C. — All preference ratings assigned to fuel-oil purchases have been cancelled by the War Production Board. The order was issued May 5 because, the WPB explained, some oil companies have been refusing to deliver fuel oil without preference ratings. The cancellation specifically provides that sales and deliveries of fuel oil may be made without regard to preference rating heretofore issued.

The new Order M-144 provides that no preference rating may be assigned to purchases of fuel oil, except for use in ocean-going vessels without express permission from the director of industry operations exempting the transaction from the provisions of M-144.

The chief cause of difficulty was the practice of some companies having high priority-order jobs building up inventories of fuel oil to unreasonable levels. The order follows:

TITLE 32—NATIONAL DEFENSE
CHAPTER 9—WAR PRODUCTION BOARD
Subchapter B—Division of Industry Operations
Part 1115—Fuel Oil
Preference Rating Exclusion Order M-114

The fulfillment of the requirements for the defense of the United States has created a shortage in fuel oil which will result, in certain areas, in a shortage in the supply of such fuel oil for defense, for private account and export; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense.

Section 1115.2 — Preference Rating Exclusion Order M-144

(a) Applicability of Priorities Regulation 1.

This order and all transactions affected thereby are subject to the provisions of Priorities Regulation 1 (Part 944), as amended from time to time, except to the extent that any provisions of this order may be inconsistent therewith, in which case such provision shall govern.

(b) Definitions.

1. "Person" means any individual, partnership, association, business trust corporation, governmental corporation or agency or any organized group of persons, whether incorporated or not.

2. "Fuel oil" means any liquid petroleum classified as Grade 1, 2, 3, 4, 5, or 6, including Bunker C fuel oil, kerosene, range oil, gas oils, and any other liquid petroleum product used for the same purpose as the above designated grades.

(c) Exclusion of fuel oil from certain provisions of priority regulations and orders.

1. Notwithstanding the provisions of any regulation, order, direction or certificate heretofore issued by the director of industry operations of the War Production Board or the director of priorities of the Office of Production Management, deliveries of fuel oil may be made by any person to any persons for any purpose without regard to any preference rating assigned to the purchase, sale or delivery of such fuel oil. No person shall require the application of a preference rating assigned by any such regulation, order, direction or certificate to the purchase, sale or delivery of fuel oil and, except as provided in paragraph (*c*) (2) hereof, no such purchase, sale or delivery of fuel oil shall be deemed to bear any preference rating whatsoever.

2. No preference rating shall be assigned to any purchase, sale or delivery of fuel oil (other than to a purchase, sale or delivery of fuel oil for use in ocean-going vessels) by any regulation, order, direction or certificate hereafter issued by or under the authority of the director of industry operations, except by or pursuant to a regulation or order hereafter issued by the director of industry operations specifically assigning the rating and excepting the transaction from the provisions of this order.

(d) Violations or false statements.

Any persons who wilfully violates any provision of this order or who wilfully furnishes false information to the director of industry operations in connection with this order is guilty of a crime, and upon conviction may be punished by fine or

Sketches of Plant Operators . . .

DONALD J. SMITH, vice president of Pan American Refining Corp., who is more readily recognized as "Don" Smith, has started on his second quarter century in the oil industry. His first began shortly after he graduated from the University of Illinois with a bachelor of science degree in 1914. His second quarter century began a year or so ago as vice president in charge of manufacturing for Pan American.

Mr. Smith was born in Normal, Ill., June 24, 1892. Shortly after his graduation from college he went to work for the Standard Oil Co. (Indiana), and from 1916 to 1920 served as superintendent of natural-gasoline plants at Tulsa and Drumright, Okla. In 1920 he was made chief engineer of the Rocky Mountain division with headquarters in Casper, Wyo., where he remained for 7 years.

In 1927 Mr. Smith was advanced to assistant general manager of manufacturing operations for Pan American Petroleum & Transport Co. in New York and Aruba, Netherlands West Indies. He held that position until 1932, when he was elected vice president in charge of manufacturing for Pan American Refining Corp. He is also vice president of Mexican Petroleum Co. of Georgia, which has a refinery at Savannah. Under his supervision are Pan American's model refinery at Texas City and two smaller plants at Destrehan, La., and Baltimore, Md. In addition he is a member of the transportation committee of District 1.

Mr. Smith and the former Miss Agnes C. Anderson were married at Ardmore, Okla., in 1919. They have one daughter, Margaret Virginia, 15. Membership in the Scarsdale, N. Y., Golf Club gives an indication of mode of recreation Mr. Smith would follow if he had time.

imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using material under priority control and may be deprived of priorities assistance by the director of industry operations.

(e) Effective date.

This order shall take effect May 5 and shall continue in effect until revoked.

•

WHO'S WHO IN REFINING

Humble Oil & Refining Co.

FOUR refineries operated in Texas by Humble Oil & Refining Co. increased their throughput 18 per cent last year to a new high average of 190,000 bbl. daily. Meanwhile, the company completed construction on some units, started others and planned installation of additional equipment for the production of materials particularly necessary for warfare.

Production of aviation gasoline was increased by 40 per cent during 1941 and plans have been made for still further increases this year. High priority ratings have been secured for expansion of alkylation facilities, for the construction of a superfractionating unit to make aviation base stocks and for another alkylation plant. Construction was started in August 1941 on a fluid catalyst cracking unit which will be completed this year. The unit is designed to process 14,000 bbl. daily of gas oil and to improve the yield and octane of gasoline.

A summary of the company's refinery operations is shown below:

Location—	Crude-oil capacity (bbl. daily)	Cracked gasoline (bbl. daily)
Baytown, Tex.	185,000	37,500
Ingleside, Tex.	35,000	7,800
Neches, Tex.	5,000	.....
San Antonio, Tex.	5,600	.....
Total	230,600	45,300

In addition to yields of a full range of petroleum products, Humble completed late last year a large installation for recovery of toluene, a unit operated under contract with the federal Government which is the nominal owner of the plant.

The company, the annual report relates, has entered into contracts with the Government for the construction and operation by Humble of a large plant for production of butadiene. Humble will supply the butylenes separation of which will require investment of from $10,000,000 to $12,000,000 in new refinery equipment, including an additional fluid catalyst cracking unit, utility facilities and other auxiliaries.

Humble has been asked to supply raw materials, assist the Government in the construction of and operate a Government owned plant for the manufacture of butyl rubber in substantial quantities. Humble Oil & Refining Co. is a fully-integrated affiliate of Standard Oil Co. (New Jersey) which owns a majority of the outstanding stock. Operations of Humble cover Texas and New Mexico, parts of southern Louisiana and several other southern states.

Refineries of the company are supplied by Humble's production department and by the pipeline subsidiary. As one of the large suppliers of crude to Standard Oil Co. of New Jersey's eastern refineries, Humble normally is the largest purchaser of oil in Texas. The company, through Humble Pipe Line Co., operates 5,300 miles of trunk line and 2,600 miles of gathering arteries.

Total sales through 240 service stations were 5 per cent greater in 1941 than in the preceding year. Sales through 128 bulk stations were up 30 per cent while tank-car and direct sales were greater by 100 per cent. Sales of aviation gasoline and fuel oil accounted for practically all of the increase in tank-car and direct sales. Hines H. Baker, formerly a member of the legal staff, is now vice president in charge of manufacturing operations and director of marketing.

Participation in the production of war materials has caused renewed concentration on research and development phases of all operations. H. D. Wilde, Jr., is director of this department.

The Baytown plant is under supervision of G. L. Farned and James Harrop is assistant superintendent. H. F. Goss and W. H. Barber are superintendent and assistant, respectively, at the Ingleside plant and C. M. Dennison is supervisor at Neches. C. M. Bell is superintendent and E. H. Seeley, assistant, at the San Antonio plant.

Naphthalene Distribution To Be Restricted June 1

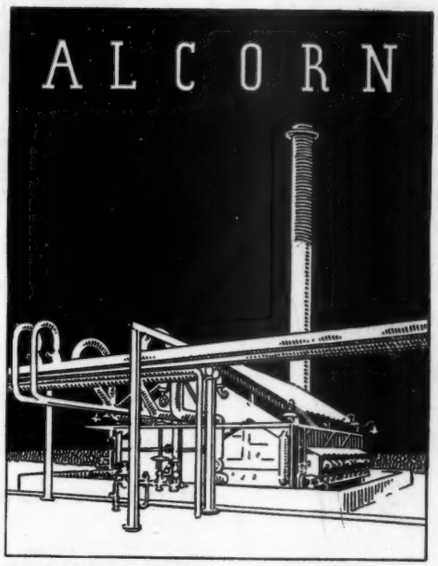
WASHINGTON, D. C.—Distribution of naphthalene will be placed under rigid allocation control, commencing June 1, by the terms of Conservation Order M-105, issued May 6.

Naphthalene is used, among other things, in plastics, plasticizers, rubber chemicals, petroleum refining, dyestuffs, moth and insect preventives, textiles, pigments and in the mining industry.

Taylor Refining Co. Enlarging Blending, Shipping Facilities

CORPUS CHRISTI, Tex.—The Taylor Refining Co. is constructing an additional 80,000-lb. capacity tetraethyl lead blending unit and a 30-car loading rack at its Corpus Christi, Tex., refinery. Both units will be completed by May 15.

FOR EIGHTEEN YEARS
LEADERS IN OIL FURNACE WORK



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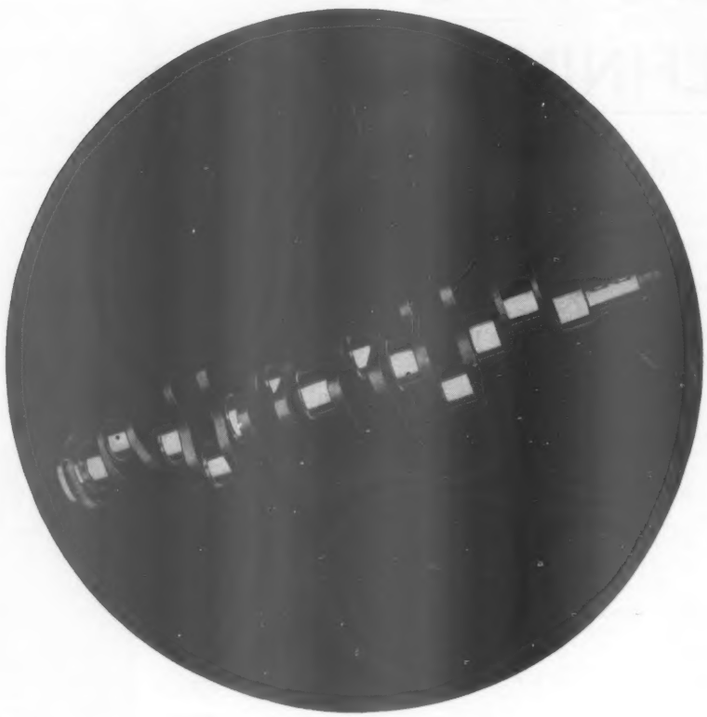

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Pipe-Line Activity

Third Application for Big Line to Be Made by Ickes

Proposal for a 1,500-mile pipe line from Texas to the New York-Philadelphia area has been again brought forward with contention that it offers the principal hope for lifting eastern motorists from extremely short rations of gasoline and for assuring adequate oil for heating homes.

Government oil officials said that Petroleum Coordinator Ickes intended to submit to the War Production Board this week a third application for priorities on the metal needed to build the line. He has been turned down twice.

The Petroleum Industry War Council, it was disclosed, told Mr. Ickes that the pipe line was the only solution to the precarious eastern petroleum situation that will put an estimated one-third of the area's 10,000,000 automobiles on rations of 3 gal. a week.

Stanolind Studies Proposals For Enlarging Texas Line

Following up suggestions of OPC, Stanolind Pipe Line Co. has been studying problems connected with proposals for looping its trunk-line system in order to handle an additional 10,000 bbl. daily of crude oil, in movements northward from Graford in the Mineral Wells, Tex., area. Stanolind previously agreed to move 10,000 bbl. daily from the Gulf Coast to the Graford station.

Shell Postpones Projects for Increasing North Texas Outlets

Although Shell Pipe Line Corp. has been granted an A-3 rating on its application for the laying of pipe to connect Hull-Silk, Scotland, Antelope, Joy and New York City pools in North Texas with the company's system at Healdton, Okla., decision has been reached, in view of the increasing shortage of strategic materials, to postpone the project indefinitely.

Work on Oklahoma Natural Gas-Line Project Started

Construction operations started this week on 96 miles of 12-in. for Oklahoma Natural Gas Co. between Chickasha and Stroud, Okla. About 50 miles of pipe is on hand and the remainder is expected later this month. The contractor, E. M. Campbell & Co., has established headquarters at Stroud, Okla. The construction superintendent is J. D. Amsey.

Last week work was started on a suspension bridge to support the line across the Canadian River. The bridge will have a main span of 1,750 ft. and a loaded backstay of 850 ft.

Preparations Are Made for Seven Pipe-Line Projects

Work is getting under way on seven of 10 proposed pipe-line projects designed to relieve the oil shortage on the Atlantic seaboard, according to a report of the Transportation Committee of the Petroleum Industry War Council.

All of the projects, Chairman W. Alton Jones reported, that are started or will start soon, contemplate the use primarily of pipe and pumping equipment taken from existing lines.

Projects, including the major line from East Texas to New York and Philadelphia, which would require new pipe and other materials in large quantities, are still "marking time," Jones said.

One of the major projects soon to be started, he reported, will consist of reversing a crude line between East Texas and Houston, Tex., and extending it to a point on the Ohio River. The line is expected to move approximately 75,000 bbl. of crude daily to the river terminal from which it will be carried to eastern points by barge and rail.

Plans also are well under way for extending both ends of the Plantation Pipe Line Corp. gasoline line, which now operates from Baton Rouge to Greensboro, N. C.

Federal Government May Share Transportation Cost

The federal Government soon may be forced to share the costs of moving oil by overland carriers into the shortage-stricken Atlantic seaboard, officials said last week.

A slight price increase already has been authorized, but it far from compensates for the estimated $130,000,000 annually that it will cost the industry if current extraordinary expenditures continue, it was said.

A committee of industry economists reported that these costs "cannot be carried much longer, as they already are threatening the solvency of many companies and may shortly cause a complete economic breakdown of the industry."

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ELECTRIC WELDED
By H. C. PRICE CO.

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CLASSIFICATION OF CRUDE OILS

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AUTHENTIC AND IMPARTIAL SAYBOLT ANALYSES OF CRUDE OILS, NATURAL GAS AND NATURAL GASOLINE ARE BEING USED AS A BASIS FOR THIS CLASSIFICATION.

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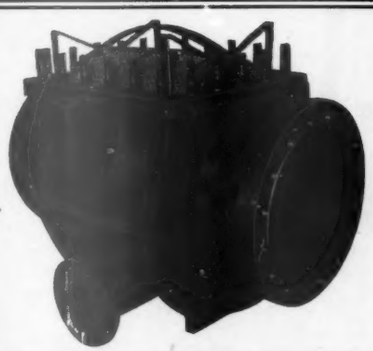

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The Wheatley Streamlined Strainer fits directly into the line eliminating all drop pressure. The necessity of digging a pit, as is customary when installing the old vertical type, is also eliminated.

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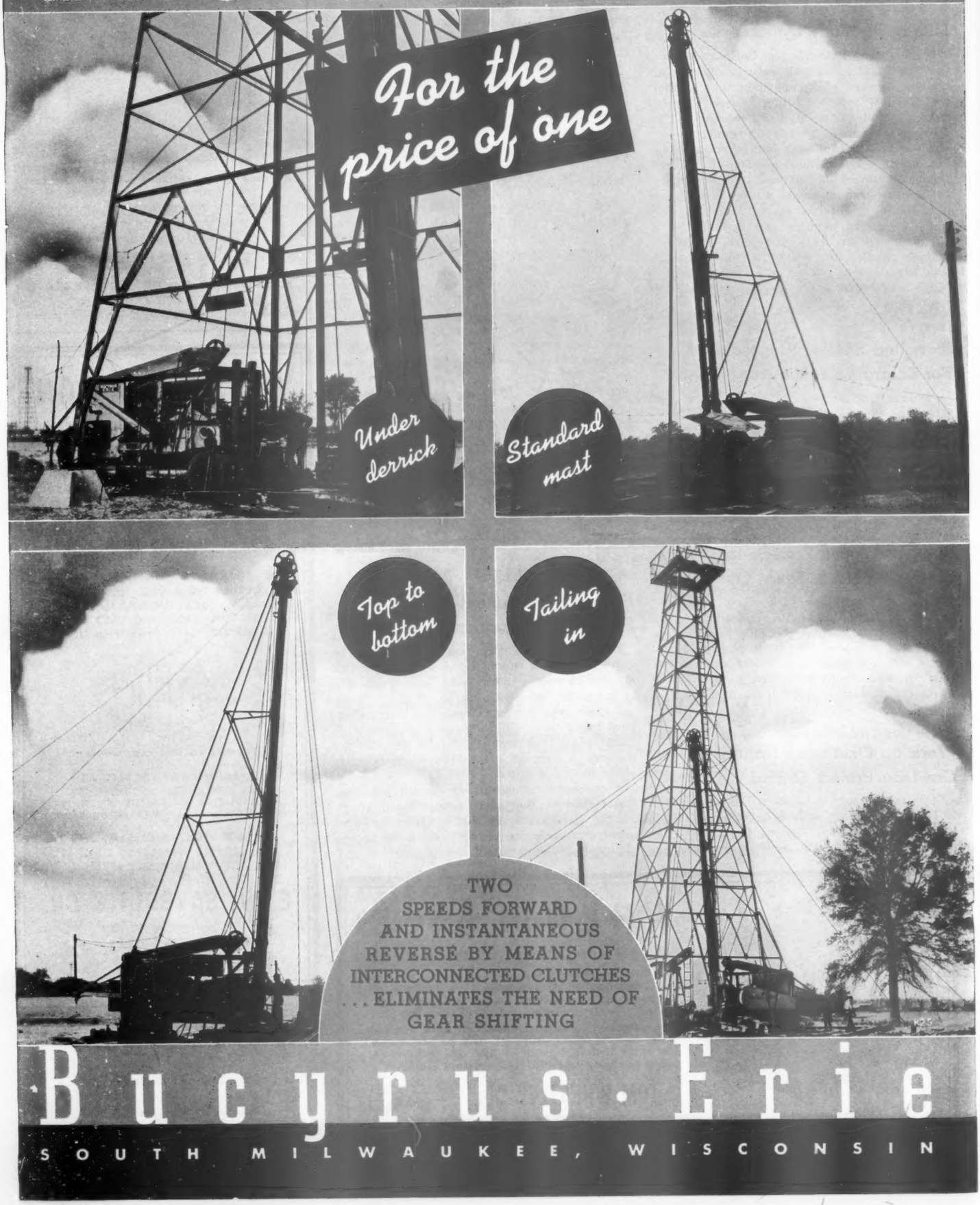
TWO RIGS IN ONE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TWO SPEEDS FORWARD AND INSTANTANEOUS REVERSE BY MEANS OF INTERCONNECTED CLUTCHES . . . ELIMINATES THE NEED OF GEAR SHIFTING

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

The number of completions reported last week returned to the normal level of between 325 and 350, being 52 above the preceding week. Oil wells were up 36, gas wells 1 and dry holes 15.

Some time ago, OPC officials announced that exceptions to M-68 would be granted more readily in three classes of field than in others. These were shallow fields, salt domes and complexly faulted structures. As evidence that this loosening of restrictions is being gradually brought about are reports from Ohio, Illinois and Montana this week. The first more or less blanket exceptions were in the Appalachian area where there is a steadily growing demand for Pennsylvania Grade crude and gas. The announcement that the newly discovered Clayton pool in eastern Ohio would also receive a blanket exception was in line with the earlier ruling.

Some multiple sand fields, such as K.M.A., where strict adherence to M-68 would have prevented exploitation of deep flush pays were next relieved from the provision that only one well should be drilled on each 40 acres regardless of the number of pays involved. Next came a series of exceptions for the southern Arkansas sour-gas fields where the gas and byproducts were urgently needed. This week an Illinois congressman reports that OPC will soon recommend changes in the spacing program which will permit one well to as little as 5 acres in shallow fields. In Montana, operators in Kevin-Sunburst have been permitted to go ahead on a 20-acre basis.

The sum total of all of these exceptions does not indicate a general nationwide removal of restrictions. Without exception, OPC appears to have based its rulings on market demand. Where the oil is needed, operators are permitted to go after it.

The suggestion made at the beginning of the year that allocations would be made on the basis of reserves after due consideration of market demand and allowance for stripper wells seems to some to have gone by the board. The transportation tie-up has, at least temporarily, compelled OPC to forget this phase of its regulatory activities. This will, of course, necessitate even greater postwar readjustments as the areas which are closest to the market will be more seriously depleted at that time and the areas whose production is now on a greatly reduced basis will be called upon to produce more oil than their share of the market last year gave them.

KANSAS: Breford and Northeast Peace Creek are extended. The one-well Haller pool, producing from the Topeka lime, has a second pay—the Lansing-Kansas City (p. 114).

WEST CENTRAL TEXAS: First production for Coke County is reported from a lime in the Cisco, and two pool openers have been found in Coleman County (p. 119).

OKLAHOMA: A new Wilcox sand pool has been found in Pawnee County and the West Earlsboro and Hotulke areas were linked by a good well in the Hunton (p. 117).

ILLINOIS: A substantial increase in permits is announced and operators are heartened by a report of OPC proposals to permit drilling of wells less than 2,500 ft. in depth on closer spacing. Activity is increasing in the Boulder field in Clinton County and discoveries are reported in Franklin and Gallatin counties (p. 110).

SOUTHWEST TEXAS: Glasscock's wildcat southeast of Mineral in Bee County is preparing to test the Hockleyensis while the discovery in the same pay west of Beeville made 14,000,000 cu. ft. of gas with some distillate. The South Caesar Wilcox production is limited on the east by a dry hole and another Carrizo-Wilcox test west of Tuleta is also dry. Exploration for this pay is continuing, however (p. 115).

TEXAS GULF COAST: After elimination of salt water, Gulfboard's discovery south of Ganado, Jackson County, gaged 104 bbl. through choke. A showing is reported south of Magnet in Wharton County and a new Wilcox sand has been opened up in the Fred field, Tyler County (p. 111).

CALIFORNIA: A new heavy crude field has been opened up southwest of North Belridge. The pay is in the Temblor and was found at a shallow depth. Raisin City's first big well produced at the rate of over 4,000 bbl. A new gas field has been opened up in the Petaluma area (p. 121).

WEST TEXAS: Ellenburger possibilities are greatly enlarged as a result of two discoveries last week. In southwestern Andrews County, 40 miles north of any other Ordovician production a Phillips test flowed over 100 bbl. an hour on test. In Ward County, 12 miles northwest of the Sand Hills field, Shell got a deep Ellenburger well making a small flow after acid. A new Permian basin lime pool is in prospect south of Shipley and east of South Ward (p. 108).

LOUISIANA GULF COAST: A new deep sand has been found on the northeast flank of West Gueydan (p. 113).

MICHIGAN: Monroe production has been found in the Adams field 3 miles west of the pool opener in that pay. Oil is reported from the Dundee flanking the Evarts gas field in Osceola County (p. 116).

WYOMING: Superior's Tensleep sand discovery well at Pilot Butte pumped 375 bbl. a day on a 2-day test. Extensions are recorded for Oregon Basin and Wertz (p. 118).

EAST TEXAS: The south offset to the Concord discovery in Anderson County is running high (p. 119).

ARKANSAS: With the Midway field widening as new producers are found to the southeast, Barnsdall is starting a test 3 miles north and west of the discovery well on what some believe is a parallel structure (p. 124).

NORTH TEXAS: Jack County's reported Ellenburger discovery near Post Oak is showing water. A Grayson County wildcat northwest of Sadler is showing oil in a formation tentatively classed as basal Strawn (p. 119).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended May 9, 1942)

	Oil	Gas	Dry	Total	Footage	Tll. comp. to date 1942	Tll. comp. to date 1941
N. Y., Pa., and W. Va.	49	16	3	68	140,080	1,378	1,645
Ohio	6	10	10	26	49,714	349	524
Indiana	1	0	1	2	4,074	132	148
Kentucky	0	3	0	3	5,904	144	204
Illinois	13	0	18	31	82,231	605	1,030
Michigan	15	2	3	20	50,690	247	289
Kansas	12	3	11	26	76,247	548	614
Nebraska	0	0	0	0	0	17	32
Missouri, Iowa	0	0	2	2	1,198	9	4
Oklahoma	4	1	9	14	40,423	489	514
Texas:							
North Central Texas	11	1	7	19	49,410	496	945
West Texas	20	0	4	24	102,433	648	686
Texas Panhandle	4	0	1	5	14,480	183	179
East Texas	4	0	3	7	35,061	167	415
Texas Gulf Coast	16	0	1	17	102,659	326	369
Southwest Texas	11	1	12	24	98,446	531	583
Total Texas	66	2	28	96	402,489	2,351	3,177
North Louisiana	6	0	4	10	41,316	207	212
Louisiana Gulf Coast	9	1	6	16	129,896	219	291
Total Louisiana	15	1	10	26	171,212	426	503
Arkansas	3	0	2	5	30,155	55	60
Mississippi and Southeast	0	0	0	0	0	33	86
Montana	2	0	0	2	6,026	55	80
Wyoming	7	0	0	7	35,141	37	41
Colorado, Utah	0	0	0	0	0	4	11
New Mexico	3	0	2	5	14,260	88	102
California	9	1	3	13	68,941	297	363
Total United States	205	39	102	346	1,178,785	7,264	9,427
Total previous week	169	38	87	294			
Week ended May 10, 1941	394	47	136	577			

Illinois Basin Discovery Rate Shows Drop This Year

By HERNDON E. DAVID

THE discovery of the Bartelso pool in southern Clinton County a little more than 6 years ago was the forerunner of one of the greatest oil booms in history—the Illinois basin play. Although widespread exploration and development did not immediately follow the Bartelso discovery, the fuse was lighted and when the Pure Oil Co. drilled a well in what is now the Clay City field which was completed as the largest well east of the Mississippi River, the boom was on. Then followed the discovery of such pools as Louden and Salem which today rank among the top oil-producing fields of the nation. With the discovery of these pools the majority of the state's activity shifted to Fayette and Marion counties which remained as the two most active counties in Illinois until late in 1940. The concentration of activity in these counties, however, did not slow down exploration in the remainder of the basin and pools have been discovered throughout the basin area at an almost unequaled rate.

When the known oil deposits are mapped with regard to the formations from which the oil is obtained the resulting picture displays definite trends, or areas, in which the majority of the pools produce from the same sand or series of sands. In this manner the entire state may be divided into six such areas with a few outlying fields which appear to have no relation to a particular area with regard to the formation from which the oil is produced.

Centralia, Salem Area

It was in this area that the basin play started with the discovery of the Bartelso pool in 1936. Within a year following this discovery, the new Centralia, Salem and Patoka fields were discovered and extensive exploration has continued to the present time with the Woodlawn field being the most recent important discovery within this area. Prior to the discovery of Devonian production in the Sandoval field in 1938, all development was in sands of Pennsylvanian and upper Mississippian (Chester) age. Production from the Pennsylvanian sands is relatively unimportant and was developed mostly in the old fields. The upper Mississippian sands, however, contain important quantities of oil and have been found productive in all the pools in this area. Following the Sando-

ILLINOIS FIELDS

Field and sand—	Discovery	No. prod. wells	Est. daily av. prod.	Cumulative Jan. 1, 1942 (thous. bbl.)	Depth	Thickness of pay	Gravity of oil
CENTRALIA, SALEM AREA							
Alma: Rosiclare	1941	3	.....	8	2,070	20	...
Bethel	1941				1,930	8	...
Bartelso: Cypress	1936	64	600	1,092	984	24	36.2
Devonian	1939				2,429	9	41.5
Boulder: Bethel	1942	1	.....	.....	1,210	9	...
Brown: Cypress	1910	2	.....	.....	1,658	15	32.0
Carlyle: Cypress	1911	103	100	3,447	1,035	20	36.2
Centralia: Cypress	1938	792	6,200	20,084	1,200	19	36.4
Bethel	1937				1,355	23	37.4
Devonian	1939				2,860	8	37.4
Trenton	1940				4,020	39	43.2
Cordes: Bethel	1939	128	1,100	1,716	1,259	17	37.4
Cravat: Bethel	1939	11	100	125	2,066	11	35.4
Dix: Bethel	1938	78	2,300	2,369	1,948	14	38.0
Dubois: Bethel	1939	10	100	56	1,359	11	31.0
East Patoka: Cypress	1941	56	2,000	689	1,350	10	...
Bethel	1941				1,470	12	...
Fairman: Bethel	1939	24	600	540	1,462	7	38.2
Hoffman: Cypress	1939	44	300	265	1,185	9	...
Bethel	1939				1,319	7	32.2
Irvington: Bethel	1940	74	2,400	1,547	1,537	10	37.6
Devonian	1940				3,092	5	39.0
Junction City: Pennsylvanian (two sands)	1910	5	.....	.....	510-610	20-20	32.0
Langewisch-Kuester: Cypress	1910	2	.....	.....	1,658	15	32.0
McKinley: Bethel	1940	6	100	88	982	12	...
Devonian	1941				2,250	...	...
Patoka: Bethel	1937	114	1,000	2,522	1,424	16	39.5
Rosiclare	1939				1,562	33	40.9
Posey: Cypress	1941	2	.....	2	1,100	9	...
Roaches: Rosiclare	1938	10	200	339	2,190	10	37.0
McClosky	1938				2,200	12	37.0
Salem: Bethel	1938	2,379	45,500	152,293	1,797	35	38.5
Aux Vases	1939				1,813	28	38.6
McClosky	1938				1,975	17	39.0
Salem	1939				2,156	17	39.0
Devonian	1939				3,350	30	42.1
Trenton	1941				4,500	59	...
Sandoval: Bethel	1909	49	800	4,630	1,540	20	34.5
Devonian	1938				2,924	9	38.0
South Dix: Bethel	1941	1	.....	.....	1,931	5	...
Tamaroa: Cypress	1942	1	.....	0	1,127	16	...
Tonti: Bethel	1939	56	2,600	4,719	1,928	14	38.0
Aux Vases	1939				2,003	26	37.0
McClosky	1939				2,134	12	39.4
Devonian	1940				3,490	15	42.0
Wamac: Petro (Pennsylvanian)	1921	36	.....	439	720	20	30.2
West Centralia: Bethel	1940	8	.....	.....	1,408	7	37.0
Woodlawn: Bethel	1940	143	10,800	2,534	1,974	16	37.5
LOUDEN AREA							
Iola: Aux Vases	1939	3	.....	11	2,335	4	35.4
Lakewood: Bethel	1941	2	.....	8	1,700	6	...
Aux Vases	1941				1,721	11	...
Louden: Cypress	1938	1,918	49,500	69,719	1,470	25	36.6
Paint Creek	1938				1,530	17	37.8
Bethel	1937				1,550	18	38.5
Devonian	1941				3,000	1	...
Mason: Bethel	1941	17	300	154	2,300	7	...
McClosky	1940				2,491	4	38.5
St. James: Cypress	1938	182	4,200	4,184	1,581	16	34.0
Golconda	1940				1,490	...	...
St. Paul: Bethel	1941	4	100	4	1,876	9	...
Sorento: Devonian	1938	1	.....	4	1,830	5	...
Stewardson: Aux Vases	1939	3	.....	22	1,942	5	37.8
Woburn: Bethel	1940	28	300	254	1,008	11	36.4

(Continued on Next Page)

DISCOVERIES IN ILLINOIS, JANUARY-APRIL 1942

Field and county—	Discovery well—	Location—	Date completed		Production (bbl.) and sand—	Depth
North Sims, Wayne	Texas 2 B. Talbert	S½ SW SE 17-1s-6e	1- 6-42	S	303, McClosky	3,183
Samsville, Edwards	K. M. Menefee 2 McDowell	SW SE NE 31-1n-11e	1-20-42	P	20 oil and 100 water, Waltersburg	2,403
Plainview, Macoupin	R. G. Whipple 1 H. C. Rhodes	NW SE SW 35-9n-8w	1-27-42	P	10 oil and 8 water, Pottsville	400
*Rural Hill, Hamilton	D. Ring 1 Craddock	NE SE NW 22-6s-5e	1- 6-42	P	180 oil and 14 water, Aux Vases	3,189
†Alma, Marion	Texas 1 J. Mazanek	NW NW SW 36-4n-2e	1-20-42	P	15 oil and 3 water, Bethel	1,930
†Sims, Wayne	Texas 2 H. O. Fuhrer	W½ SW SE 28-1s-6e	1-20-42	P	30, Levias	3,070
*Bonpas West, Richland	Bonpas Dev. 2 J. M. Woods	W½ SW SE 21-2n-14w	2-17-42	F	1,086, McClosky	3,090
*Maunie North, White	J. Dawson et al 1 H. L. Clark	NW SW NE 36-5s-10e	2-10-42	P	23 oil and 13 water, McClosky	3,048
North Albion, Edwards	Taylor Drlg. 1 Odle	S½ SE SW 30-1s-11e	3-31-42	P	19, Aux Vases	3,054
Akin, Franklin	Seaboard Oil 1 U. S. Coal & Coke	SW SE 14-6s-4e	3-24-42	P	113 oil and 85 water, Cypress	2,839
Bible Grove, Clay	Cameron Bros. 1 E. H. Landwehr	NW NW NE 8-5n-7e	3-24-42	P	695, McClosky	2,810
North Carmi, White	Seaboard Oil 1 Gates	SW NW SW 3-5s-9e	3-24-42	P	62 oil and 38 water, Aux Vases	3,228
Coll, Wayne	First Nat. Pet. Trust 1 Ellis	SW NE 18-1s-5e	3-31-42	P	450, Aux Vases	2,918
Concord, White	Minerva Oil 1 P. Ramsey	N½ SW NE 33-6s-10e	3-17-42	P	28 oil and 4 water, Aux Vases	2,904
West Johnsonville, Wayne	Bell Bros. 1 E. Jones	W½ NE SE 24-1n-5e	3-10-42	P	8, McClosky	3,107
New Bellair, Crawford	W. Krohn 1 E. Wiman	N½ NE SE 19-8n-13w	3-10-42	P	55 oil and 75 water, Penn.	1,169
Tamaroa, Perry	Harsh 1 Newborn	SE SE NW 22-4s-1w	3-24-42	P	16 oil and 10 water, Weller	1,127
*Herald, White	Carter 1 E. A. Marlin	SW NW 35-6s-9e	3-10-42	P	72 oil and 58 water, Bethel	2,792
*Rural Hill, Hamilton	D. S. Ring 1 S. Johnson	NW SE 21-6s-5e	3-31-42	P	8 oil and 33 water, Aux Vases	3,170
†North Benton, Franklin	A. W. Torbett 1-A Isaacs	SW SE NW 1-6s-2e	3-24-42	P	30 oil and 25 water, Paint Creek	2,603
†North Sims, Wayne	Pure Oil 1 W. L. Reed	S½ SE SW 17-1s-6e	3-17-42	P	243, Rosiclare	3,152
Sumpter, White	Sun Oil 1 G. Hertlein	S½ SE SW 13-4s-9e	4- 7-42	P	94, McClosky	3,259
East Centralia, Marion	Louis Lilly 1 Leonard estate	NE SE NE 17-1n-1e	4-14-42	P	55, Stein (Penn)	1,667
Merriam, Wayne	New Penn Dev. 1 L. P. Harris	W½ NW NE 28-2s-9e	4-14-42	P	201, McClosky	3,265
Kell, Jefferson	Deaton & Bears 1 Belle Howard	NE NE NW 5-1s-3e	4-21-42	P	192, McClosky	2,625

*Extension. †New pay.

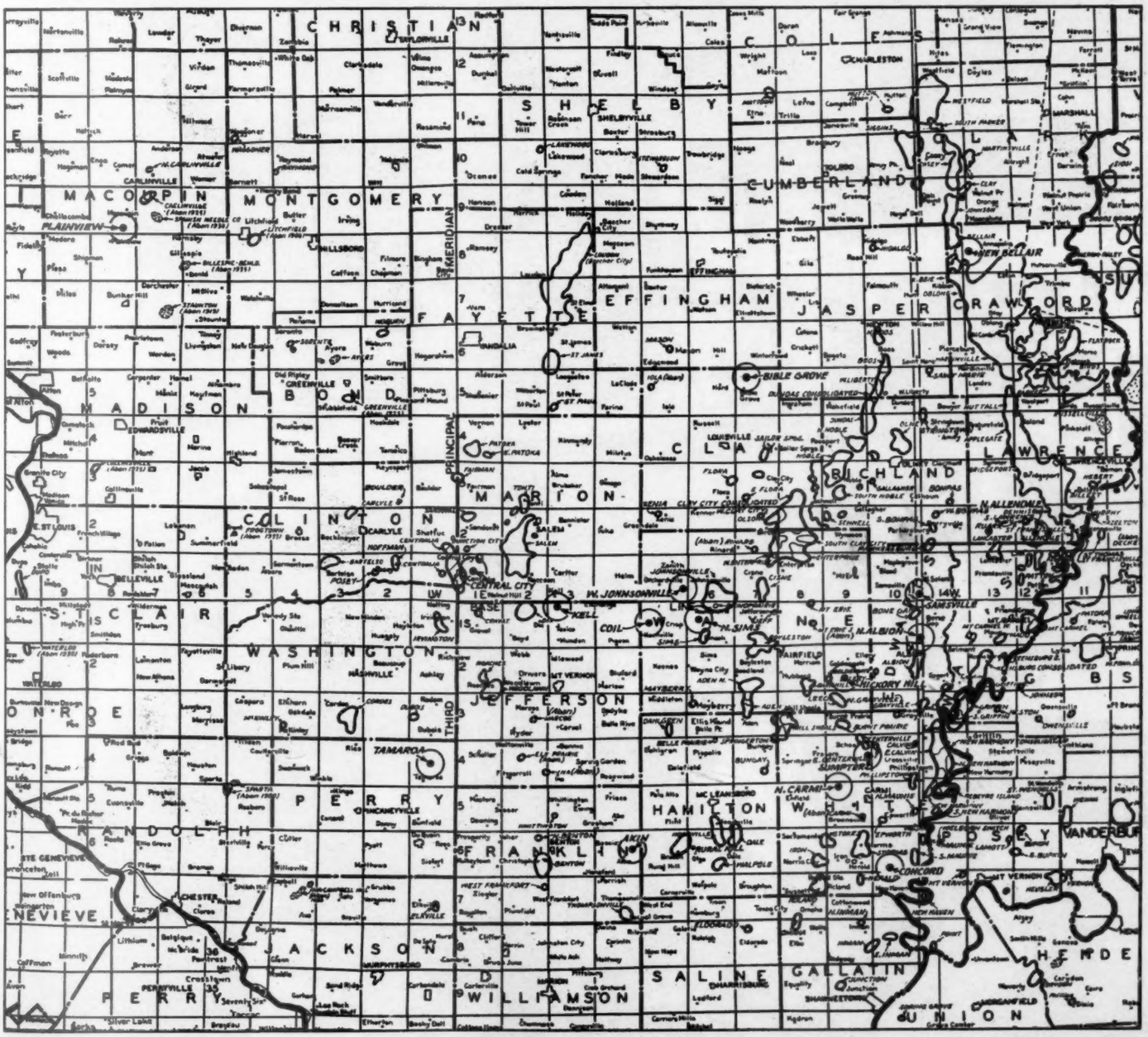
val-Devonian discovery, production was opened from lower Mississippian limes at Salem, Roaches and Tonti. The Salem field produced prolifically from the McClosky while the lower Mississippian pays at Roaches and Tonti were of considerably less importance. The Devonian has been found productive at Bartelso, Centralia, Irvington, McKinley, Salem, Sandoval and Tonti. Nowhere in the area, however, has it produced so prolifically as at Salem and Centralia. Devonian wells in these fields were the largest ever completed in the state and the Devonian production at Salem alone increased the state's production many thousands of barrels daily. Trenton oil has been found in only two new fields in Illinois, Salem and Centralia. Trenton production from Centralia is unimportant and oil recovered from the Trenton in Salem amounts to somewhat less than 1,000,000 bbl. The porosity in both of these fields is tight and initial productions above 200 bbl. are exceptional.

The majority of the fields in the Centralia-Salem area are located on the Louden axis and near the Clinton-Marion County line on a trend with the Duquoin flexure. The structures of the fields in this area are mainly anticlines and domes. Most of the productive sands are more uniform in their physical characteristics, and the

ILLINOIS FIELDS (Continued)

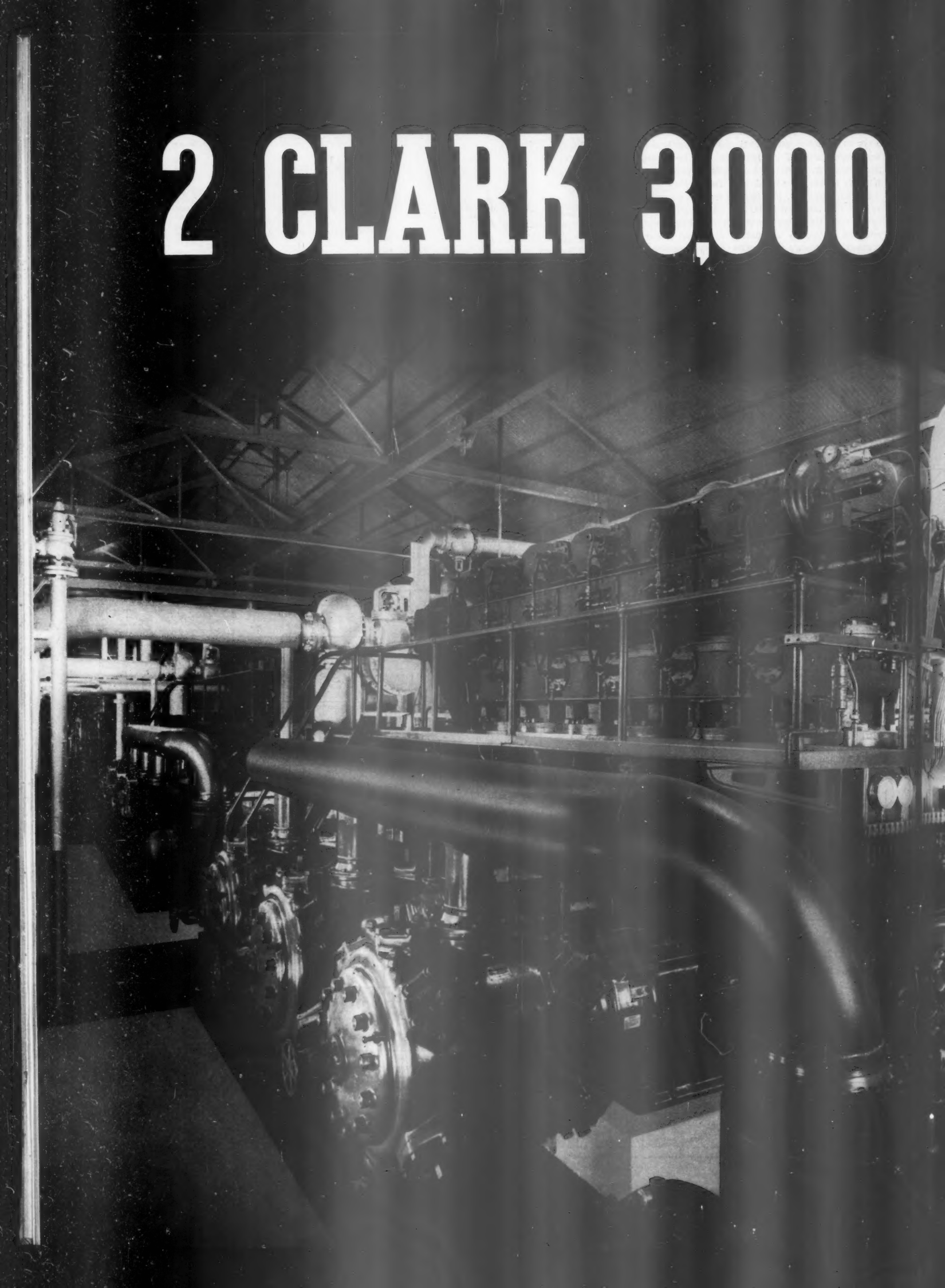
Field and sand—	Discovery	No. prod. wells	Est. daily av. prod.	Cumulative Jan. 1, 1942 (thous. bbl.)	Depth	Thickness of pay	Gravity of oil
DALE, HOODVILLE AREA							
Akin: Cypress	1942	1	.....	.....	2,839	12	...
Benton: Tar Springs	1941	223	17,000	6,990	2,108	34	...
Bungay: Aux Vases	1941	1	.....	3	3,270	13	...
Dale: Cypress	1940	139	9,000	2,884	2,678	18	37.6
Bethel	1941				2,950	18	...
Aux Vases	1941				2,970	18	...
Levias	1941				3,000	13	...
McClosky	1940				3,143	16	39.0
Hoodville: Bethel	1940	156	6,000	4,066	2,952	20	38.0
Aux Vases	1941				3,040	7	...
McClosky	1940				3,146	14	39.1
North Benton: Paint Creek	1942	9	.....	23	2,603	13	...
Levias	1941				2,710	11	...
Rosiclare	1941				2,800	5	...
Rural Hill: Aux Vases	1941	142	16,000	1,615	3,200	19	...
Levias	1941				3,210	15	...
McClosky	1941				3,250	11	...
Thompsonville: McClosky	1940	18	100	188	3,121	12	...
Walpole: Aux Vases	1941	29	1,700	210	3,070	23	...
West Frankfort: Tar Springs	1941	1	.....	.....	2,040	14	...
Whittington: McClosky	1939	1	.....	16	2,870	9	...
St. Louis	1939				3,060	7½	37.2
WABASH RIVER (Upper Chester) AREA							
Concord: Aux Vases	1942	1	.....	0	2,904	9	...
Cowling: Cypress	1939	12	100	245	2,620	12	36.6
East Inman: Penn. sand	1940	40	1,600	466	780	8	...
Tar Springs	1940				2,082	4	...
Cypress	1940				2,430	10	...
McClosky	1940				2,740	12	...
East Keensburg: McClosky	1939	3	.....	.....	2,703	6	37.6

(Continued on Page 104)



Oil-field map of Illinois. Discoveries in 1942 shown in circles

2 CLARK 3,000



H.P. Steam "Angles"

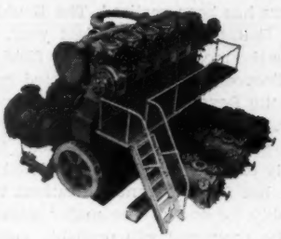
AND 3-1000 H. P. GAS-DRIVEN "ANGLES" IN THE UNION OIL COMPANY REFINERY

at Oleum, California . . . are serving in two important ways in making Hi Octane gasoline.

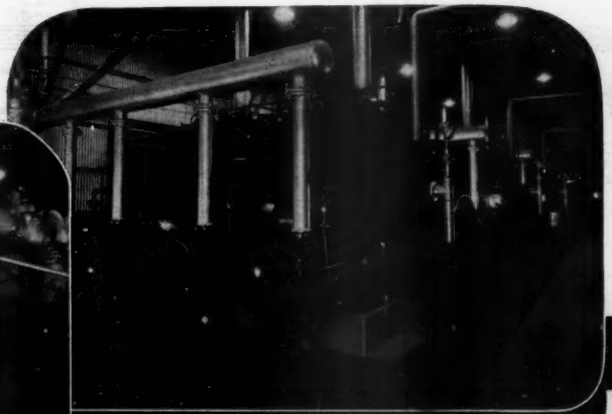
Low quality gasolines are being converted into Hi Octane gasoline by catalytic cracking. The 2 CLARK 3,000 H. P. steam-driven "Angles" furnish compressed air to burn coke, tar and asphalt from the catalyst, keeping it in efficient operation. A gas residue is then compressed by the 3 CLARK 1000 H. P. Supercharged gas-driven "Angles" to recover 8 to 15 additional gallons of highest grade gasoline per 1000 cu. ft. of residue gas.

In defense production, CLARK "Angles" are also being used for Alkylation, another new cheap method for making 100 Octane gasoline, and for producing Toluol for TNT, Artificial Rubber, Synthetic Alcohol, Synthetic Ammonia for explosives, and other important products.

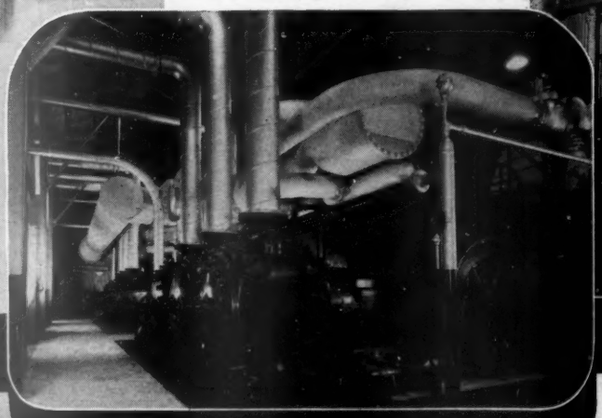
For more than 6 decades CLARK Compressors have been proving their dependability, averaging probably 98% continuous operation with few shut downs and these only after long service. Features are CLARK Super-2-Cycle Fuel Injection, no inlet or outlet valves, large bearings and few, large parts.



CLARK Steam-Driven "Angle" Compressors are offered in 3, 4, 5, 6 and 8-cylinder models ranging from 500 to 4,000 H. P. New, efficient. Ask for Bulletin 200-73.



Three CLARK 1,000 H. P. Supercharged Gas-Driven "Angles" Union Refinery



At left and above: Two views of CLARK 3,000 H. P. Steam "Angles", Union Refinery

CLARK BROS. CO., INC., Olean, N. Y. Export Offices: 30 Rockefeller Plaza, New York. Domestic Sales Offices and Warehouses: Tulsa, Okla.; Houston, Tex.; Chicago, Ill. (122 S. Michigan Av.); Boston, Mass. (131 Clarendon St.); Huntington Park, Calif. (5715 Bicket St.) Foreign Offices: 72 Turnmill St., E. C. 1, London; Avda Roque Saenz Pena 832, Buenos Aires.

CLARK

structural influence has been more effective than elsewhere in the state. The Salem field is an outstanding example of an oil field of symmetrical form where the deeper productive horizons lie vertically beneath the shallower ones. Beneath this field there are five major productive zones whose development has occasioned the completion of nearly 2,800 wells.

Deep sands have been extensively tested in the fields in this area and, although porous limestones are known to exist below the Devonian, no oil has been found below this formation except in the Trenton. Several wildcats have penetrated these deeper sands in the area but as yet none has found commercial production. With the exception of the Devonian it is unlikely that any important amounts of oil will be found in the deeper sands.

The Centralia-Salem area has been fairly active with regard to wildcatting during 1942, but very little success has been realized. The Boulder pool in Clinton County, discovered last year, at present looms as the most important new field in the state. The discovery well was completed as a dry gas well in the Devonian and was never produced. Recently, however, an offset to this well was completed as a large producer from the Bethel sand. Only one well has been completed in the field so far, but from present indications the field will probably be one of the major Illinois discoveries of the year, and will probably result in extensive testing of the Chester sands throughout the area.

Louden Area

The first production in the Louden area was discovered in 1937 in the Louden pool. Since that time, comparatively few pools have been discovered in the area and, with the exception of the St. James pool, these have been small pools of relatively little importance. The Louden and St. James fields alone have accounted for the ma-

ILLINOIS FIELDS (Continued)

Field and sand—	Discovery	No. prod. wells	Est. daily av. prod.	Cumulative Jan. 1, 1942 (thous. bbl.)	Depth	Thickness of pay	Gravity of oil
Eldorado: McClosky	1941	2	.....	1	2,943	7	...
Epworth: Palestine	1941	8	100	14	2,100	23	...
Grayville: McClosky	1939	4	100	135	3,093	6	35.8
Herald: Pennsylvanian sand	1940	6	.....	24	1,500	22	28.0
Tar Springs	1940				2,326	18	35.0
Inman: Palestine	1940				1,830	10	...
Rosiclare	1940	8	In East Inman		2,803	14	...
McClosky	1940				2,730	12	...
Iron: Tar Springs	1940				2,425	6	...
Hardinsburg	1940				2,537	18	37.2
Cypress	1940	65	1,600	1,918	2,708	16	...
Bethel	1941				2,790	9	...
McClosky	1940				3,061	6	38.5
Junction: Waltersburg	1939	14	600	169	1,763	15	37.2
Keensburg: Biehl (Pennsylvanian)	1940				1,753	14	...
Palestine	1939				1,819	16	...
Cypress	1939	299	5,900	6,061	2,433	17	38.6
Bethel	1941				2,570	17	...
Aux Vases	1941				2,760	...	...
McClosky	1941				2,790	7	...
Lancaster: McClosky	1940	23	100	440	2,683	9	39.8
Maud: Waltersburg	1941				1,920	14	36.2
Bethel	1940	18	200	248	2,120	12	...
Rosiclare	1941				2,640	11	...
McClosky	1940				2,614	8	38.0
Maunie: Palestine	1941	3	.....	4	2,010	6	...
Mount Carmel: Biehl (Pensylvanian)	1941				1,490	24	...
Palestine	1941				1,540	...	...
Cypress	1940	189	4,200	1,717	2,033	9	39.0
Bethel	1941				2,100	7	...
Rosiclare	1940				2,368	4	36.6
McClosky	1941				2,370	12	...
New Haven: Tar Springs	1941				2,110	18	...
Hardinsburg	1941	19	500	172	2,348	...	...
Cypress	1941				2,451	15	...
McClosky	1941				2,819	5	...
New Harmony: Waltersburg	1939				2,156	43	37.6
Tar Springs	1940				2,225	20	38.0
Cypress	1940				2,561	24	...
Paint Creek	1940	667	19,300	11,729	2,665	15	...
Bethel	1940				2,710	18	36.0
Aux Vases	1940				2,820	20	...
Rosiclare	1940				2,906	14	...
McClosky	1939				2,892	8	39.2
North Carmi: Aux Vases	1942	1	.....	0	3,228	12	...
North Maunie: Bethel	1941	4	.....	6	2,840	18	...
McClosky	1941				3,190	9	...
Omaha: Palestine	1940	20	900	370	1,672	32	25.9
Tar Springs	1941				1,880	15	...
Phillipstown: Degonia	1941				2,000	...	...
Tar Springs	1941				2,289	...	...
Aux Vases	1939	11	100	125	2,942	8	39.4
Rosiclare	1941				2,961	11	...
McClosky	1939				2,955	10	38.2

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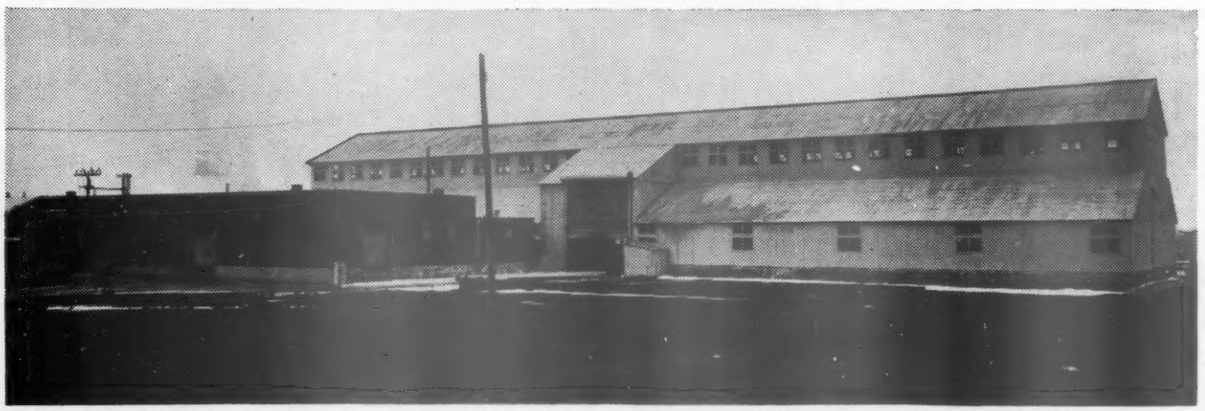
INDUSTRIAL PROPERTY FOR SALE

TULSA, OKLAHOMA



THE NATIONAL SUPPLY CO. OFFERS THIS LARGE WAREHOUSE PROPERTY IN TULSA AT A VERY ATTRACTIVE PRICE.

There are 18 acres of land with two Frisco switch tracks through the property.

The large steel building is 80′x234′ with a basement 40′x80′. A 10-ton electric hoist runs the entire length of the building. Solid concrete floors and R. R. switch track through the building.

The brick warehouse is 40′x104′ with solid concrete floors. It is arranged for both storage and office space. The buildings are connected.

These buildings are in good condition and this property is located in the heart of Tulsa's industrial section. The taxes are very reasonable.

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jority of the activity in this area.

The structures of the pools in the Louden area are rather well defined as compared to the pools on the eastern side of the basin. The only important production in the area has been obtained from the pools along the Louden-Salem axis. The largest percentage of the production is obtained from upper Chester sands while the Aux Vases produces in most of the smaller pools. Production has been obtained from the Devonian at Sorento and Louden but this is far less prolific than in the Salem and Centralia fields to the south. However, development of the Devonian at Louden is not yet complete and it may produce important quantities of oil. The Trenton has been tested and found unproductive at Louden but formations below the McClosky have not been very extensively tested elsewhere in the area and these deeper sands may yet be found to contain commercial quantities of oil.

Activity in the Louden area at present is at a low ebb and will probably be confined to occasional wildcat tests unless a prolific new pool is opened. It is unlikely that any but small scattered pools will be found for some time to come. The district, however, contains large unexplored areas.

Dale, Hoodville Area

The Dale-Hoodville area is another recently developed area in Illinois. The only production in the area prior to 1939 was in the Whittington pool of Franklin County and this has been small. The first important production was obtained in 1940 with the discovery of the Dale and Hoodville fields. The Benton field, discovered in 1941, in the single year since its discovery has produced nearly 50 per cent of all the oil that the area has produced. The Rural Hill field is also one of the outstanding discoveries of last year and is producing at present about 30 per cent of the oil shipped from the area.

Production in the Dale-Hoodville area is obtained from upper and lower Chester sands, the lower Chester (Aux Vases) and McClosky production predominating in most of the fields. The Benton field is the exception since it produces only from the Tar Springs. The Tar Springs at Benton alone has produced about 75 per cent of the oil which has been recovered from this formation throughout the state. The Dale and Hoodville fields also produce in important quantities from the upper Chester sands.

The discovery of commercial quantities of oil in some of the sands in this area has exerted a great influence on exploration in the entire basin area of the state. The Tar Springs was thought of as an unimportant horizon until the discovery of the Benton field. Following the discovery operators undertook an extensive search for this sand throughout the state which resulted in the discovery of several important Tar Springs pools. Outside of the Benton field, however, Tar Springs production is confined to the Wabash River area. When the Aux Vases was found to be a prolific producer in this area, operators undertook more thorough testing of this sand with the result that many apparently "dry holes" have been turned into good producers. The Aux Vases is unique in that it is found to contain large quantities of oil in wells where there is no evidence of this oil either in well cuttings or electric logs. The Levias is also a discovery of this area. First production from this horizon was obtained in the Rural Hill field and has since been found productive in a great number of fields.

Exploration and development have been widespread in this area throughout the present year. No sands below the McClosky have been tested but these will probably not contain important reserves. The lower Chester sands, however, are due for continued exploration in the area and will probably yield several good pools within the near future.

Clay City Area

The discovery of the Clay City field in 1937 was the final spark which touched off the Illinois basin play. Since that time the area has become one of the most prolifically producing areas in the entire basin as a result of the discovery of such pools as Dundas, Noble and Johnsonville.

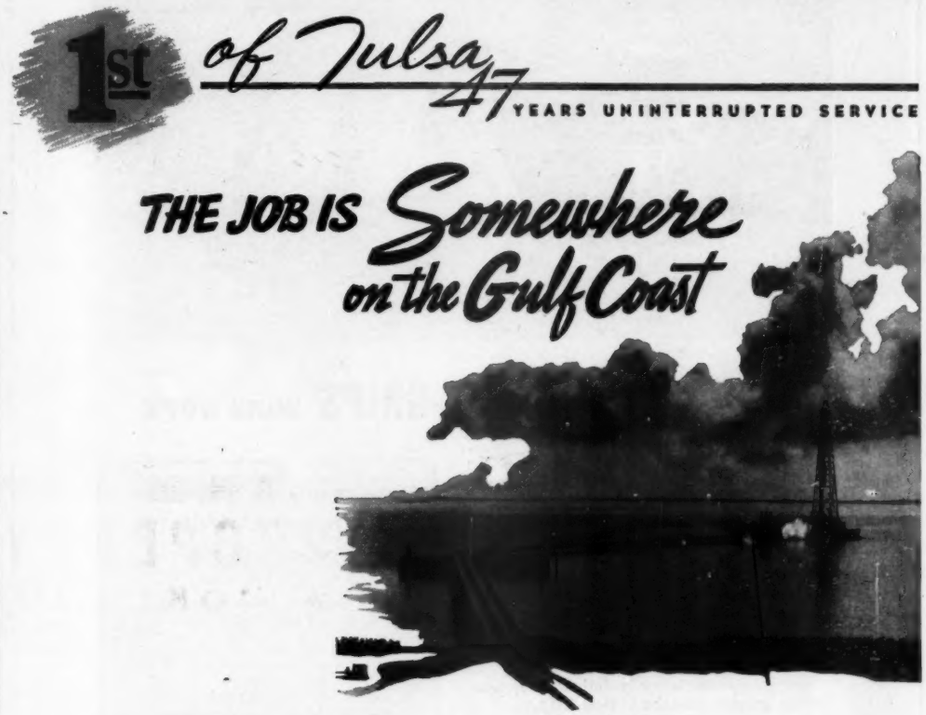
All the fields in this area produce from the McClosky with the exception of three recently discovered fields which as yet are undeveloped. Production is also obtained from lower Chester formations and, in a few scattered fields, from upper Chester sands. The Aux Vases and Levias are important producing horizons also but the McClosky oolitic member of the Fredonia lime is the outstanding pay of the area. Oil production from McClosky wells declines rapidly and usually little or no water is produced. These wells have initial productions of from a few gallons to more than 10,000 bbl. daily.

Exploration of the McClosky is under way throughout the area at the present time and several pools have been recently discovered which are as yet undeveloped. Sands below the McClosky are untested in the area at present and offer possibilities for future development. The widespread search for the McClosky alone, however, will without a doubt result in the discovery of many important fields within the remainder of the year.

Wabash River Area

The Wabash River area consists of a string of fields over 60 miles in length and extending along the Wabash River. This is the most recently developed area in the basin and since 1941 it has been the most actively developed area. Starting with Storms several of the pools along this trend were discovered in 1939 but the majority were

(Continued on Page 124)


1st of Tulsa
47 YEARS UNINTERRUPTED SERVICE
THE JOB IS Somewhere on the Gulf Coast
BUT THE MONEY CAME FROM—
FIRST NATIONAL
From 1901, when oil was discovered in the Mid-Continent, FIRST NATIONAL has served the Industry through Oil Financing. Active in every major field developed . . . active in EVERY branch of the Industry . . . FIRST NATIONAL resources and experience are available for the vital progress of the Industry through Oil Financing!
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FOUNDED 1895
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THE SAFETY CLIP FIST-GRIPS WIRE ROPE

The finger-pinch of the U-Bolt on wire rope bites and crushes the strands — breakage is possible when the bowed rope takes tension and whipping.

Use the *Fist-Grip* Safety Clip, that holds rope straight and round. Its four flat bearing surfaces act like a *fist* of drop-forged steel.

Inexperienced or rushed workers can't put it on backward — both halves are identical — no possibility of dangerous mistake.

95% rope efficiency is delivered by test — far greater than the U-Bolt Clip.

Safety Clips Give Steel for Victory Program

25% less steel goes into the set of Safety Clips that will out-hold a U-Bolt assembly. And that steel goes straight into guns and tanks and ships when you buy Safety Clips.

More than this, beside needing fewer clips, there is no waste of precious rope from cutting off U-Bolt-crushed ends.

SPEED AND SAFETY WITH SAFETY CLIPS

No rope bowing or crimping
ROPE SAVED

No battered, bent threads
CLIPS SAVED

No special wrench
TOOLS SAVED

Bolts on opposite sides
TIGHTENING TIME SAVED

Can't go on wrong
ACCIDENTS SAVED

Fewer clips needed
CLIPS SAVED

Fewer rope breaks
ACCIDENTS SAVED

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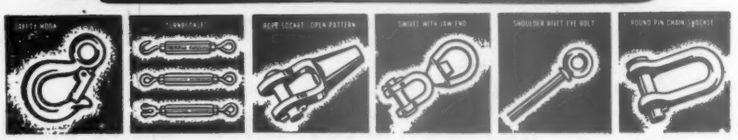
PORTLAND, MAINE



Field and sand—	Discovery
Roland: Waltersburg	1941
Tar Springs	1940
Cypress	1941
Bethel	1941
Aux Vases	1941
South Maunie: Pennsylvanian sand	1941
Palestine	1941
Tar Springs	1941
Aux Vases	1941
South New Harmony: Waltersburg	1941
Tar Springs	1941
Stokes: Paint Creek	1941
Bethel	1941
McClosky	1939
Storms: Waltersburg	1939
Tar Springs	1941
Cypress	1941
West Mount Carmel: Tar Springs	1939
CLAY CITY (McClosky) AREA	
Aden: McClosky	1938
Albion: Bridgeport (Pennsylvanian)	1940
Waltersburg	1940
Bethel	1941
Aux Vases	1941
McClosky	1940
Barnhill: Rosiclare	1939
McClosky	1939
Salem	1940
Bible Grove: Cypress	1942
McClosky	1942
Belle Prairie: McClosky	1940
Bone Gap: McClosky	1941
Bonpas: McClosky	1941
Boyleston: Rosiclare	1940
McClosky	1938
Centerville: McClosky	1940
Cisne: Aux Vases	1937
Rosiclare	1940
McClosky	1937
Clay City: Cypress	1937
Bethel	1940
Aux Vases	1940
Rosiclare	1940
McClosky	1937
Coil: Aux Vases	1942
Dahlgren: McClosky	1941
Dundas: Cypress	1940
Aux Vases	1941
McClosky	1940
East Centerville: Cypress	1941
McClosky	1941
Ellery: McClosky	1941
Flora: Cypress	1939
Bethel	1940
McClosky	1938
Golden Gate: Rosiclare	1941
McClosky	1939
Jeff: McClosky	1941
Johnsonville: Aux Vases	1941
Levias	1941
McClosky	1941
Leech: McClosky	1938
Mayberry: McClosky	1941
Mill Shoals: Aux Vases	1939
McClosky	1939
Mount Erie: McClosky	1938
Noble: Cypress	1938
McClosky	1937
North Aden: McClosky	1938
North Boos: McClosky	1940
North Simms: Rosiclare	1942
McClosky	1942
Olney: McClosky	1937
Parkersburg: McClosky	1941
Ste. Marie: McClosky	1941
Sailor Springs: Tar Springs	1941
Cypress	1941
McClosky	1941
Samsville: Waltersburg	1942
Schnell: McClosky	1938
Sims: Aux Vases	1941
Levias	1942
McClosky	1941
Stringtown: McClosky	1941
West Bonpas: McClosky	1941
West Clay City: McClosky	1941
West Johnsonville: McClosky	1942
Xenia: Aux Vases	1941
Burnt Prairie: Rosiclare	1940
McClosky	1940
LA SALLE ANTICLINE AREA	
Allendale: Biehl (Pennsylvanian)	1912
Jordan (Pennsylvanian)	1912
Waltersburg	1941
Cypress	1940
Bethel	1941
McClosky	1941
East St. Francesville: Bethel	1941
New Bellair: Pennsylvanian sand	1942
Patton: McClosky	1941
Ruark: Buchanan (Pennsylvanian)	1941
South Lawrence: Buchanan (Pennsylvanian)	1941
Casey district: Many	1906
Robinson district: Penn. and U. Miss.	1906
Bridgeport district: Penn. and U. Miss.	1906
MISCELLANEOUS FIELDS	
Cook's Mills: Aux Vases	1941
Colmar-Plymouth: Devonian	1913
Dupo: Trenton	1928
Elkville: Bethel	1941
Eldorado: Cypress	1941
Hidalgo: McClosky	1940
Mattoon: Cypress	1939
McClosky	1940
North Carlinville: Pottsville (Pennsylvanian)	1941
Raymond: Pennsylvanian sand	1940
Waggoner: Pennsylvanian sand	1940
Waterloo: Trenton	1920
Plainview: Pottsville: (Pennsylvanian)	1942

FIELDS (Continued)

No. prod. wells	Est. daily av. prod.	Cumulative Jan. 1, 1942 (thous. bbl.)	Depth	Trucki- ness of pay	Gravity of oil
			2,171	13	...
			2,244	4	...
106	6,000	1,104	2,573	9	...
			2,745	12	...
			2,884	15	...
			600	16	...
58	2,000	371	2,019	13	...
			2,264	10	...
			2,837	13	...
4	.....	24	2,234	17	...
			2,348	13	...
			2,800	8	...
19	700	253	2,809	11	...
			3,077	12	35.8
			2,234	18	32.1
153	2,500	2,945	2,304	13	..
			2,676	16	...
...	.....	.....	2,793	15	...
9	300	389	3,287	7	40.0
			1,571	10	...
			2,365	10	34.0
79	1,600	1,840	2,900	18	...
			3,038	15	...
			3,108	11	40.0
			3,340	5	...
63	400	1,461	3,385	11	37.6
			3,792	22	...
2	300	.....	2,467	12	...
			2,810	7	39.6
2	.....	35	3,467	3	37.0
5	300	64	3,266	9	...
1	.....	8	3,118	11	...
104	1,900	2,352	3,273	4	...
			3,250	14	40.2
5	600	74	3,355	4	38.0
			2,982	13	38.5
45	500	2,459	3,010	17	...
			3,121	9	35.8
			2,603	14	...
			2,866	5	...
682	12,000	24,907	2,910	8	...
			2,970	6	...
			2,995	9	38.5
1	.....	.....	2,918	18	...
42	800	681	3,337	19	...
			2,488	23	...
240	10,000	7,089	2,700	6	...
			2,834	11	38.9
12	.....	50	2,887	7	...
			3,224	6	...
2	.....	13	3,340	8	...
			2,594	5	...
18	200	384	2,788	12	37.4
			2,965	6	37.2
5	.....	.....	3,320	11	...
			3,337	7	34.4
1	.....	4	3,135	19	...
			2,994	14	...
247	17,600	5,531	3,100	2	...
			3,133	22	...
14	100	302	3,413	11	39.0
2	.....	6	3,376	16	...
105	3,500	1,656	3,221	10	39.8
			3,316	14	38.0
1	.....	11	3,080	12	37.9
241	6,000	12,048	2,544	17	34.6
			2,957	10	39.0
62	1,600	2,485	3,321	12	39.0
45	2,600	995	2,791	12	38.6
3	.....	.....	3,152	5	...
			3,183	3	...
34	300	1,106	3,052	9	37.2
31	6,000	742	3,130	11	...
6	400	16	....	12	...
			2,330	6	...
28	1,000	165	2,600	9	...
			3,050	4	...
1	.....	0	2,403	4	...
4	.....	163	3,012	6	37.0
			3,012	14	...
18	300	41	3,070	4	...
...	.....	.....	3,158	9	...
5	.....	15	3,028	8	...
7	200	59	3,170	11	...
10	.....	.....	3,070	11	...
1	.....	0	3,107	2	...
1	.....	2	2,786	13	...
20	100	155	3,260	9	...
			3,425	11	37.0
			1,425	20	35.1
			1,450	18	...
206	400	4,939	1,540	16	...
			1,920	22	...
			2,010	16	...
			2,290	9	...
5	.....	....	1,747	11	...
1	.....	.....	1,169	16	...
4	.....	.....	2,309	5	...
1	.....	.....	1,514	13	...
7	.....	.....	1	12	...
4,920	1,100	53,117	255-2,708	var.	29-39
9,025	4,000	147,321	505-1,337	var.	29-33
4,432	6,000	228,056	800 1,843	var.	32-37
1	.....	.....	1,830	11	...
216	300	2,786	447	21	37.6
74	1,600	1,564	601	50	32.7
1	.....	.....	2,000	28	...
2	.....	1	2,943	12	...
1	.....	6	2,560	8	37.6
1	.....	17	1,835	25	44.1
			2,000	6	36.6
3	.....	.....	438	8	...
2	.....	2	580	18	33.5
4	.....	2	611	14	30.5
9	.....	197	410	50	30.2
1	.....	.....	400	5	...

THEY SET A TRAP...

1 **THE PUMP ROOM** of the "C" Oil Company is located under a $1,500,000 still. Positive fire protection is imperative. So the company installed a LUX system. This fire-fighting system included LUX pressure trips for windows, door and ventilator. One day the head of an oil pump "let go." Hot oil sprayed over the room and burst into flame.

2 **AN AUTOMATIC ALARM** rang in the control room.

3 **THE RELEASE** valve of the LUX System was pulled.

. . . AND CAUGHT A FIRE!

4 **THE LUX SYSTEM** snapped into instant action. LUX carbon dioxide gas, roaring from cylinders, automatically operated the pressure trips which slammed door and windows shut, switched off ventilator. Fire was trapped in the room! At the same instant, LUX snow-and-gas blasted out the flames. One of the fastest of all extinguishers, LUX gas killed the fire in a few seconds; made no mess, left no residue; harmed nothing in the room. As soon as the pump head was replaced, the pump room resumed operation.

OIL is ammunition. Guard it wisely. Protect it from fire!

Hit oil blazes with flame-killing LUX carbon dioxide snow-and-gas. Use LUX Built-in Systems for concentrated hazards—as pump-houses, storage spaces, etc. For other fires there's the wide range of LUX portables—from neat little pistol-grip 2-pounder to powerful 100-lb.-capacity wheeled unit.

Incidentally, do you know how pressure trips snap a trap on fire? Write us for complete information.

Kidde (LUX)

Walter Kidde & Company
Incorporated
534 West St., Bloomfield, N. J.

Ellenburger Found Productive In Southwest Andrews County

By ROBERT INGRAM

MIDLAND, Tex.—Ellenburger lime production was opened in Andrews County last week. It was the first pay in the county from Ordovician formations and was some 40 miles north of any other Ordovician pay in the Permian basin. In view of the increasing interest in Ordovician exploration in the basin, and also in view of the fact that production immediately south of the new pool has long been known (in such big fields as Goldsmith, Cowden, Foster and Johnson of Ector County), the development was called one of the most important in recent months.

Discovery was made by Phillips Petroleum Co. 1-A University-Andrews, Section 30, Block 10, University Survey, 1½ miles north of the discovery gas well in the West Andrews pool and close to the Ector County line. In addition to the regional significance of the well, it had the local distinction of having an unusually large initial potential. At week's end it flowed 478 bbl. of 44.3-gravity oil in 4 hours, natural, with 5½-in. casing set at 7,806 ft.

Ellenburger was topped at 7,745 ft. At total depth of 7,855 ft. a drill-stem test was taken with packer set at 7,760 ft. In 10 minutes the well started making gas, then flowed oil at a rate variously estimated at from 50 bbl. to 150 bbl. an hour. Gas was estimated at 2,500,000 cu. ft., and bottom-hole pressure was 3,200 lb. Testing continued throughout the week as operators tried to free the oil from water. An official gage will be taken later.

The Ellenburger top of 7,745 ft. places it 600 ft. higher than the Phillips 1 University, 8,365-ft. failure 1 mile east and slightly south.

Wildcat Progress

Humble Oil & Refining Co. 1 Sims, Section 24, Block A-29, P.S.L. Survey, 13 miles west of the Fullerton area in northwestern Andrews County, was drilling in lime below 4,876 ft. seeking Fullerton pay. . . . Packer failed at Magnolia Petroleum Co. 1-11-37 Ralph, Section 11, Block A-37, P.S.L. Survey, ½-mile-west extension to the Fullerton area, but the well swabbed 15 bbl. an hour before pulling tubing. . . . Mascho Oil Co. 1 University, Section 27, Block 10, University Survey, prospective discovery 2 miles northwest of the Emma pool, was still cleaning out after shot at total depth of 4,514 ft. . . . Show of oil and an odor of gas at 6,546 ft. was reported at Stanolind Oil & Gas Co. 1 Stinnett, Labor 18, League 4, San Augustine C.S.L. Survey, deep test in Lubbock County, 9 miles north of Slayton and 7 miles southeast of the Nairn pool (1 well). After logging the show, core was pulled from 6,546-56 ft. in tight, dry shaly sand, and operator was drilling ahead.

NORTHERN WEST TEXAS COMPLETIONS

Wildcats

Swisher County: Sam Weiner et al 1 H. Klean, C SW Sec. 120, Blk. M-10, B.W.&F. Sur., 10 mi. NE of Tulia, dry, top lime 4,148 ft., puff gas 4,450-65 ft., T.D. 5,226 ft.

Fields

Slaughter, Cochran County: Magnolia 3-A Dean, 1,980 ft. from S line and 660 ft. from E line, Lge. 58, Martin C.S.L. Sur., flowed 292 bbl. through 3-in. casing outlet after acid, pay 4,922 ft., T.D. 4,959 ft.

Magnolia 13-C Mallett, 580 ft. from S and E lines, Lab. 6, Lge. 51, Scurry C.S.L. Sur., flowed 584 bbl. through 3-in. casing outlet after acid, pay 5,040 ft., T.D. 5,063 ft.

Honolulu 38-15 Igoe & Smith, elev. 3,678 ft., flowed 1,186 bbl. through 2½-in. casing outlet after acid, pay 4,978 ft., T.D. 5,031 ft.

Superior 1 C. S. Dean, elev. 3,676 ft., pumped 421 bbl. oil plus 18 per cent water after acid, pay 4,924 ft., T.D. 5,015 ft.

Superior 2 Dean, elev. 3,687 ft., pumped 324 bbl. oil plus 20 per cent water after acid, pay 4,928 ft., T.D. 5,009 ft.

Slaughter, Hockley County: Magnolia 21-F Mallett, elev. 3,600 ft., flowed 1,016 bbl. through 3-in. casing outlet after acid, pay 4,945 ft., T.D. 5,006 ft.

Texas 109 Slaughter, elev. 3,564 ft., pumped 382 bbl. oil plus 3 per cent water after acid, pay 4,985 ft., T.D. 5,016 ft., P.B. 4,995 ft.

Texas 118 Slaughter, elev. 3,573 ft., pumped 366 bbl. oil plus 4 per cent water after acid, pay 4,990 ft., T.D. 5,043 ft., P.B. 5,011 ft.

Texas 132 Slaughter, 580 ft. from S and W lines, Lab. 89, Lge. 38, Zavalla C.S.L. Sur., elev. 3,562 ft., flowed 1,386 bbl. through casing after acid, pay 4,980 ft., T.D. 5,025 ft.

Slaughter, Terry County: Gulf 14 Mallett, elev. 3,508 ft., pumped 81 bbl. oil plus 14 per cent water after acid, pay 5,022 ft., T.D. 5,069 ft.

Wasson, Yoakum County: Deep Rock 4 Anderson, elev. 3,629 ft., pumped 102 bbl. after acid, pay 4,995 ft., T.D. 5,185 ft.

Ward County Tests Extends Ordovician Production

On the heels of the Ordovician discovery in Andrews County (see above) came the opening of Ellenburger pay in Ward County by Shell Oil Co.,

BOMBS OR SABOTEURS MAY NEVER REACH YOU... BUT ARE YOU Ready?

● Fires—from whatever source—are no longer just company losses. They are *national* losses. They are *victories for the enemy*.

DuGas fights fires with the speed and killing action of an armored division. DuGas, always ready for battle action, cuts priceless seconds from the extinguishing period.

DuGas, on guard at refineries, wells, and pumping stations across the nation*, is particularly effective on fires in highly inflammable liquids and gases under pressure. *Names on request.

duGas

Fire Extinguishing Apparatus

DUGAS ENGINEERING CORPORATION, Marinette, Wisconsin

REPRESENTED IN PRINCIPAL CITIES — OWNED AND OPERATED BY ANSUL CHEMICAL COMPANY

Approved by UNDERWRITERS' LABORATORIES, FACTORY MUTUAL LABORATORIES

Inc., 1 Sealy-Smith Foundation of Galveston in Section 38, Block A, G.M.&M.M.B.&A. Survey, 2½ miles northeast of Monahans.

Although this new pool is in the southern section of the Permian basin where several Ordovician pools have been opened, it is well to the west of the Sand Hills Ordovician field in Crane County and moves Ordovician production another 12 miles northwest. Production is some 2,200 ft. deeper than at the Andrews County discovery and early testing indicated that the Shell well would have a much smaller initial potential.

The Shell 1 Sealy-Smith had been drilled "tight" until last week end. Then the company announced that the test was bottomed at 10,111 ft. in dolomite, had topped the Ellenburger pay zone at 10,082 ft., had set 7⅝-in. casing at 10,077 ft. with 500 sacks of cement, had run 2-in. tubing to 10,106 ft. and on May 6 the well had flowed natural 120.1 bbl. of 47-gravity oil in 24 hours through tubing. Casing pressure dropped from 940 lb. at the start to 450 lb. at the end. Tubing pressure was 0 and gas was estimated at 142,223 cu. ft. daily, a gas-oil ratio of 1,185 to 1.

On May 7 the well was washed with 1,000 gal. of acid and swabbed in flowing 67.3 bbl. in 11¼ hours out of a 24-hour period. Operator was still testing at week's end.

Shallow Pool Showing

A new lime pay was believed opened in southeast Ward County at James O'Quinn and Ray Pool 1 C. A. Nichols, Section 5, Block 5, H.&T.C. Survey, south of the Shipley pool and east of the South Ward field. The well was last reported drilling below 2,414 ft. with 600 ft. of oil in the hole. It had found brown sand with a show at 2,399-2,406 ft., had an increase in porous lime from 2,406-12 ft. and set 7-in. casing at 2,141 ft.

Miscellaneous Developments

Humble 1-E Owens, an inside location in the Fort Lancaster area of Crockett County, was shut down after getting sulfur water at 2,155-57 ft. It is 1,980 ft. from S line and 660 ft. from E line of Section 15, Block GG, G.C.&S.F. Survey, 1 mile northwest of the discovery and between it and the Humble 1-D Owens, second producer.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

Culberson County: John Wolfe 1 Wilson-Biggs, elev. 3,153 ft., 2,316 ft. from N line and 1,500 ft. from E line Sec. 1, Blk. 112, W. N. Older Sur., northeastern part of county, dry, Delaware lime 2,798 ft., puff gas 1,218 ft., T.D. 3,030 ft.

Pecos County: J. N. Gregory 1 J. L. Neville, 1,980 ft. from S line and 660 ft. from E line Sec. 42, Blk. 12, H.&G.N. Sur., elev. 2,356 ft., dry, anhydrite 360 ft., Rustler 580 ft., Yates 820 ft., San Andres 1,602 ft., T.D. 1,681 ft.

Fields

Abell, Pecos County: Stanolind 2 Kistler, 2,004 ft. from NW line and 1,958 ft. from SE line of Sec. 5, Blk. 3, H.&T.C. Sur., flowed 563 bbl. through ¼-in. tubing choke natural, Simpson 4,895 ft., Tulip Creek 4,915 ft., McKee 5,224 ft., pay 5,274 ft. T.D. 5,305 ft., P.B. 5,290 ft.

Estes, Ward County: Gulf 167 Hutchins, elev. 2,638 ft., flowed 2,040 bbl. through casing after shot, pay 2,554 ft., T.D. 3,070 ft.

Goldsmith, Ector County: Gulf 388 Goldsmith, 440 ft. from N line and 2,218 ft. from W line Sec. 18, Twp. 1s, Blk. 44, T.&P. Sur., elev. 3,195 ft., flowed 770 bbl. through tubing after acid, sand 4,190 ft., T.D. 4,260 ft.

Johnson, Ector County: North American 3 Johnson, 990 ft. from S line and 2,310 ft. from E line Sec. 46, Blk. 43, Twp. 1s, T.&P. Sur., elev. 2,991 ft., flowed 486 bbl. through ½-in. tubing choke, pay 4,080 ft., shot, T.D. 4,142 ft.

Keystone sand, Winkler County: Richardson & Bass 2 B. F. Jenkins, elev. 2,967 ft., flowed 562 bbl. through tubing after shot, pay 3,255 ft., T.D. 3,425 ft.

Sand Hills, Crane County: Gulf 21 Waddell et al, old well, old T.D. 4,578 ft., T.D. 4,587 ft., pay 4,467 ft., flowed 1,308 bbl. through tubing.

Gulf 39 Waddell et al, 660 ft. from N and E lines Sec. 18, Blk. 3, H.&T.C. Sur., elev. 2,466 ft., flowed 1,931 bbl. oil and 868 bbl. water through tubing after acid, pay 4,111 ft., detrital 5,565 ft., Ellenburger 5,663 ft., *southeast offset to Gulf 1-B Tubb, Ordovician producer in north end*, T.D. 5,701 ft.

Magnolia 13 P. J. Lea, 660 ft. from S line and 1,980 ft. from E line of Sec. 4, Blk. 32, P.S.L. Sur., elev. 2,616 ft., flowed 182 bbl. through ½-in. tub-

(Continued on Page 123)

Don't Guess

BOTTOM HOLE PRESSURES IN 2 ZONE WELLS

an OTIS TYPE G (Side Door) CHOKE

MAKES POSSIBLE ACCURATE PRESSURE GAUGING OF EITHER ZONE . . .

ACCURATE knowledge of *Bottom Hole Pressure* is *necessary* for efficient production.

The OTIS Type G Choke provides a means to take Bottom Hole Pressures of either producing zone INDEPENDENTLY of the other.

The Type G landing nipple, which is made up in the tubing string, has four ½-inch holes through its walls, permitting flow from the casing annulus or upper zone into the tubing. The Removable Choke seats and locks in the landing nipple and provides complete control of the entrance of fluid into the tubing string from either or both pays.

By using a blank cup mandrel, the side ports of the landing nipple can be blanked off, permitting flow into the tubing from the lower pay only. The Bottom Hole Pressure can then be accurately taken of the lower zone.

To reverse these conditions, a perforated cup mandrel with its lower end plugged is used. This combination shuts off the lower zone, and permits the pressure to be taken from the upper pay only.

The running and pulling of the Type G Choke can be done under pressure on the same steel measuring line used to run the bottom hole pressure instruments.

The Type G Choke is a versatile tool and there are many ways it can be efficiently used in dual formations. Consult your nearest Otis representative or write direct for complete information and details.

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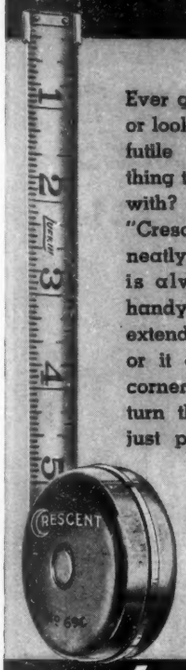

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ILLINOIS FIELD REPORT

Current Drilling Activity Centers on Boulder Area

MATTOON, Ill.—Illinois operators grew even more optimistic over amendments to federal drilling restrictions last week after an announcement by Representative McKeough (Democrat, Illinois) that the Office of Petroleum Coordinator would soon recommend changes in the restrictions. McKeough's announcement said Ickes' office would recommend that the present one well to 40-acre spacing requirement of Order M-68 be amended to permit the drilling of one well to 5 acres to all sands less than 500 ft. in depth; one well to 10 acres for all wells that will be between 500 and 1,500 ft. in depth; one well to 20 acres for all wells between 1,500 and 2,500 ft. in depth, while one well to 40 acres for all wells more than 2,500 ft. in depth will continue to be the basis for further study of individual cases which will receive recommendations based upon their particular merits.

Also brightening the picture was the Texas Co.'s impending completion of a second well in the new Boulder field of Clinton County, and announcement by the state Oil and Gas Conservation Division of a substantial increase in the number of drilling permits issued.

With the pool opening E. Frank Jones 1 Harrison, NE SE NE NW 2-2n-2w, expected to produce more than 300 bbl. daily, and several offsets and other tests in the area under way, leaseholders in the new Boulder field are looking forward to a great amount of activity during the coming summer. The Jones well topped good Benoist saturation at 1,202 ft. and the second well in the field, Texas Co. 2 Price Gray, SW NW SE 35-3n-2w, an offset to the Devonian gas completion, Texas 1 Price Gray, also topped good saturation at 1,202 ft. The 1 Harrison, however, is the first oil well in the area and is about ½ mile south of the Gray property.

Directly north of the pool opener tools are being moved in at Murphy-Goldsmith 1 Murphy-Goldsmith, NE NE NW 2-2n-2w. It will probably begin drilling immediately. Meanwhile, to the south, another offset location, Gulf 1 White, NE NE SW 2-2n-2w, is still waiting on permit. E. Frank Jones is expected to offset his well on the east and west.

New Pool Looms in Franklin County

One of the most important tests of the week, Ike Taylor 1 Old Ben Coal, a wildcat in NE NW NE 19-5s-2e, south of Sessar in Franklin County, was expected to produce from the Aux Vases and open a new pool. Casing was set to 2,693 ft. and on a 1-hour drill-stem test 1,300 ft. of oil was recovered. Total depth of the hole is 2,716 ft.

Taylor's test is less than a mile northeast of J. W. Menhall 1 Old Ben Coal, NW NE NW 25-5s-1e, which is also scheduled to test Aux Vases saturation. The test was drilled by the Sun Oil Co. but was taken over by Menhall for completion.

Meanwhile, in Gallatin County, R. Bruce Martin 1 Behl, SE SE NW 18-8s-9e, 5 miles west of the Inman pool, was showing for a pool opener after swabbing 32 bbl. of oil in 6 hours from the Cypress sand.

ILLINOIS COMPLETIONS

Wildcats

Bond County: T. A. Booth et al 2 Mantz, NE NW NW 27-5n-4w, dry at 60 ft.

Clay County: Cameron Bros. 1 C. Hendy, S½ SW NE 24-3n-5e, location abandoned.

Franklin County: W. F. Catlett 1 Franklin County Mining Co., N½ NW SE 1-7s-4e, dry at 3,457 ft., Kincaid 2,048 ft., Menard 2,341 ft., Glen Dean 2,671 ft., Hardinsburg 2,779 ft., Golconda 2,802 ft., Barlow 2,940 ft., Cypress sand 3,005 ft., Paint Creek 3,086 ft., Benoist 3,160 ft., Aux Vases sand 3,262 ft., Ste. Genevieve 3,276 ft., Rosiclare 3,326 ft., Fredonia 3,386 ft., McClosky 3,401 ft.

Hamilton County: Spitznagel et al 1 Keith estate, NW NW SE 26-4s-7e, dry at 3,502 ft., Kincaid 2,165 ft., Degonia 2,284 ft., Clore 2,317 ft., Palestine 2,333 ft., Menard 2,476 ft., Waltersburg 2,548 ft., Vienna 2,635 ft., Tar Springs 2,642 ft., Glen Dean 2,716 ft., Hardinsburg 2,766 ft., Golconda 2,832 ft., Barlow 2,970 ft., Cypress sand 3,026 ft., Paint Creek sand 3,156 ft., Benoist 3,170 ft., Renault 3,226 ft., Aux Vases 3,306 ft., Ste. Genevieve 3,348 ft., Rosiclare 3,363 ft., Fredonia 3,374 ft., McClosky 3,384 ft.

Graddy & Daniel 1 J. J. Pickens, NE SW 30-5s-3e, dry at 3,091 ft., Menard 2,000 ft., Waltersburg 2,068 ft., Vienna 2,131 ft., Tar Springs 2,219 ft., Glen Dean 2,231 ft., Golconda 2,337 ft., Barlow 2,449 ft., Cypress sand 2,518 ft., Paint Creek 2,566 ft., Paint Creek sand 2,615 ft., Benoist 2,669 ft., Benoist sand 2,683 ft., Renault 2,717 ft., Aux Vases sand 2,734 ft., Ste. Genevieve 2,784 ft., Rosiclare 2,813 ft., Fredonia 2,861 ft., McClosky 2,871 ft., St. Louis 2,979 ft.

H. Fotiades 1 E. A. Mangis, SW NW SE 27-5s-5e, dry at 3,481 ft., base Pennsylvanian 2,135 ft., Degonia 2,202 ft., Clore 2,302 ft., Palestine 2,310 ft., Menard 2,428 ft., Waltersburg 2,516 ft., Vienna 2,577 ft., Tar Springs 2,586 ft., Glen Dean 2,682 ft., Golconda 2,802 ft., Benoist 3,201 ft., Renault 3,222 ft., Aux Vases sand 3,239 ft., Ste. Genevieve 3,268 ft.

Jasper County: Oexner Oil 1 R. W. Higgins, E½ SW SW 17-2n-10e, dry at 2,898 ft., Glen Dean 2,275 ft., Barlow 2,430 ft., Benoist 2,663 ft., Renault 2,700 ft., Ste. Genevieve 2,765 ft., Fredonia 2,822 ft.

C. R. Craft 1 H. O. Garner, SW NW SE 16-6n-8e, dry at 3,202 ft., Menard 2,250 ft., Glen Dean 2,540 ft., Benoist 2,869 ft., Ste. Genevieve 2,992 ft., Fredonia 3,015 ft., McClosky 3,069 ft.

Jefferson County: Ruwaldt & Bayer 1 I. W. Mace, NW NE SE 33-3s-3e, location abandoned.

Lawrence County: C. H. Pariott 1 Robeson, SE NW NE 16-3n-10w, dry at 1,377 ft.

DeKalb Agricultural Association 1 F. Mieure, SW NE NE 8-2n-12w, dry at 1,530 ft.

Richland County: Seaboard 1 Kimmel, E½ SE SW 32-3n-14w, dry at 3,232 ft., Glen Dean 2,591 ft., Golconda 2,688 ft., Barlow 2,786 ft., Benoist 2,944 ft., Renault 2,983 ft., Aux Vases 3,055 ft., Ste. Genevieve 2,113 ft.

Schuyler County: Walter Vette 1 Prudential Life, SW SW SW 25-3n-4w, dry at 924 ft., base Pennsylvanian 140 ft., Trenton 764 ft.

Wayne County: Illinois-Mid-Continent 1 Fisher Comm., W½ NE NW 27-2s-9e, location abandoned.

White County: Carter 1 Chas. Weazel, SE NE 34-6s-9e, dry at 2,766 ft., Menard 2,121 ft., Glen Dean 2,365 ft., Barlow 2,576 ft., Benoist 2,753 ft.

Fields

Calvin, White County: A. Anderson 1 W. Johnson, SE NE NW 12-4s-10e, dry at 3,165 ft., Menard 2,260 ft., Glen Dean 2,490 ft., Golconda 2,630 ft., Barlow 2,732 ft., Ste. Genevieve 3,045 ft., Fredonia 3,065 ft., McClosky 3,082 ft.

Clay City, Wayne County: Pure 1 E. M. Barrett, SE NW 11-1n-7e, pumped 22 bbl. oil and 3 bbl. water, natural, Rosiclare 3,030 ft., saturation 3,032-36 ft., 3,044-45 ft., Aux Vases 2,955 ft., T.D. 3,093 ft.

Dale, Hamilton County: Texas 1 Irvin, NW NE SW 12-6s-6e, flowed 527 bbl., 40-qt. shot 3,030-50 ft., Aux Vases 3,024 ft., T.D. 3,050 ft.

Carter 1 P. Short, NW NW SE 12-6s-6e, flowed 303 bbl., 30-qt. shot 3,027-36 ft., 20-qt. shot 3,046-52 ft., Aux Vases 3,018 ft., T.D. 3,055 ft.

Dundas, Jasper County: Pure 4 McCormack, SW SE 19-5n-10e, flowed 280 bbl., 5,000 gal. acid, McClosky 2,827-30 ft., 2,835-40 ft., T.D. 2,865 ft.

Fairfield, Wayne County: Pure 1 Leininger, W½ NE SW 1-2s-7e, pumped 256 bbl. oil and 67 bbl. water, natural, McClosky 3,310-25 ft., T.D. 3,325 ft.

Hoodville, Hamilton County: Texas 1-C J. C. Hall, NW NE NW 13-6s-6e, flowed 268 bbl., 20-qt. shot 3,086-3,100 ft., Aux Vases 3,082-3,101 ft., T.D. 3,102 ft.

Maud, Wabash County: Burr Lambert A-2 Seiler, NE SE SE 27-1s-13w, dry at 2,671 ft., Menard 1,792 ft., Waltersburg 1,856 ft., Vienna 1,892 ft., Tar Springs sand 1,920 ft., Glen Dean 2,054 ft., Hardinsburg 2,059 ft., Golconda 2,163 ft., Barlow 2,256 ft., Cypress sand 2,279 ft., Paint Creek 2,357 ft., Benoist 2,391 ft., Renault 2,467 ft., Ste. Genevieve 2,548 ft., Rosiclare 2,581 ft., Fredonia 2,604 ft., McClosky 2,610 ft.

Mill Shoals, White County: Texas 20-A A. J. Poorman, NW NW 30-3s-8e, dry at 3,256 ft., Menard 2,388 ft.,

(Continued on Page 117)

TEXAS GULF COAST

New Producing Area Opened in Frio in Jackson County

By F. L. SINGLETON

HOUSTON, Tex. — Gulfboard Oil Co., which opened a new producing area south of the Ganado field, Jackson County, the previous week, was rigging up for a second test, 1,320 ft. due east of the discovery well. The well is 2 J. E. Harmon in the Morris & Cummings Survey. In the meantime, salt water which menaced the discovery well, was eliminated during the week by a successful "squeeze" job and the well was officially completed by reperforating casing at 5,366-74 ft. On an initial gage the well flowed 104 bbl. of 28.8-gravity oil per day through a 5/32-in. choke. Tubing pressure was 340 lb. The new area is located only a mile south of the Ganado field which produces from several sands in the Frio formation at intervals from approximately 5,100 ft. to 6,500 ft. It is possible that the 5,300-ft. sand correlates with one of the upper sands, however, additional development will have to be undertaken before this is determined.

Jackson County gained a new wildcat operation as Moore & Ahern moved in a rig for J. M. Heard, 5 miles northeast of Ganado in the T. J. Winston Survey. In spite of the curtailment in drilling operations along the Gulf Coast district, this county continues to lead all other areas in drilling operations and this activity is expected to be maintained at a fairly steady pace as the result of recent developments. Including the above-mentioned area, additional operations have been started in the Looney's Branch or Mayo field, where an important south extension was established, while southwest of the Mauritz field considerable semiwildcat activity is anticipated following the completion of J. B. Coffee 1 Mauritz which is shut in for a potential test after flowing at the rate of 90 bbl. of oil and 7 per cent salt water from the Frio sand at 5,447-62 ft. While the fields at this time do not have the appearance of developing into such large reserves as West Ranch, Lolita, and several others, there is sufficient evidence to promote a continued exploration campaign.

Show Reported in Test North of Magnet Field

Operators interested in the Magnet area, Wharton County, were watching the progress of Pierce Withers 1 Wharton Bank & Trust Co., north of the Magnet field, which logged sufficient showings for drill-stem testing. The tests were made at 5,459-79 ft., but both failed due to mechanical trouble and the well is coring ahead below 5,500 ft. The Discorbis was topped at 4,978-5,009 ft., Heterostegina 5,100 ft., and round Marginulina at 5,371 ft.

Kirby Petroleum Co. 1 Muldoon, a Wilcox test located in Newton County, cored salt-water sand in top of the Wilcox at 8,693 ft., and the well is temporarily shut down at 9,270 ft. due to stuck drill stem. Across the line in Tyler County, Humble 1 Goolsbee, B.B.B.&C. Survey, was drilling in sand and shale below 5,850 ft., while on the same trend, but located in Grimes County, H. C. Cockburn resumed operations in 1 C. B. Stewart, 2 miles northwest of Todd, and is coring in sandy shale below 7,768 ft.

Wilcox sand production in the Fred field, Tyler County, was opened from a new sand with the completion of Stanolind 2 Parker, about 1,500 ft. east of the discovery well, which flowed 113 bbl. per day through a 4/16-in. choke from perforated casing opposite sand at 8,612-22 ft. The new sand is 432 ft. deeper than the discovery well, completed at 8,180-8,200 ft.

Tentative locations for three shallow tests are reported to have been made by the Pioneer Exploration Co. to be drilled on the Southern Pine Lumber Co. lease in Angelina, Houston, and San Jacinto counties. The first test is slated to be drilled in Angelina County, the second on the C. W. Tier 160-acre tract in Houston County, and the third in San Jacinto County. Contract depth of these tests are reported to be 4,000 ft.

TEXAS GULF COAST COMPLETIONS

Wildcats

Grimes County: Magnolia 1 Brigance, dry, T.D. 8,862 ft.

Fields

Fig Ridge, Chambers County: C. M. and V. Frost 2 fee, 178 bbl., ⅛-in. choke, perf. casing 8,521-53 ft., T.D. 8,583 ft.

Texas 7 Broussard, 610 bbl., ¼-in. choke, perf. casing 8,550-70 ft., T.D. 8,600 ft.

Lolita, Jackson County: Cox & Hamon 1 Mitchell, 69 bbl. oil and 132 bbl. salt water, 9/64-in. choke, perf. casing 5,296-97 ft., T.D. 5,954 ft. casing 5,286-92 ft., T.D. 5,950 ft

Skelly 4-B Mitchell, 165 bbl., 5/32-in. choke, perf. casing 5,218-25 ft., T.D. 5,232 ft.

Stanolind 1 A. E. Westhoff, 165 bbl., ⅛-in. choke perf. casing 5,207-12 ft., T.D. 5,343 ft.

North La Ward, Jackson County. Gulfboard 1 McDickey, 12 bbl., 9/64-in. choke, T.D. 5,235 ft.

Magnolia 1-A Four Way ranch, 57 bbl., ⅜-in. choke, perf. casing 5,205-21 ft., T.D. 5,231 ft.

South Ganado, Jackson County: Gulfboard 1 J. E. Harmon, 104 bbl., 5/32-in. choke, perf. casing 5,366-74 ft., T.D. 5,717 ft.

West Ganado, Jackson County: Pure 6 Cravens, 76 bbl., ⅛-in. choke, perf. casing 4,748-65 ft., T.D. 4,850 ft.

Pure 3 Weisse, 87 bbl., ⅛-in. choke, perf. casing 4,745-66 ft., T.D. 4,850 ft.

Withers, Wharton County: F. W. Michaux 22-A Pierce, 126 bbl., 5/32-in. choke, perf. casing 5,368-76 ft., T.D. 5,400 ft.

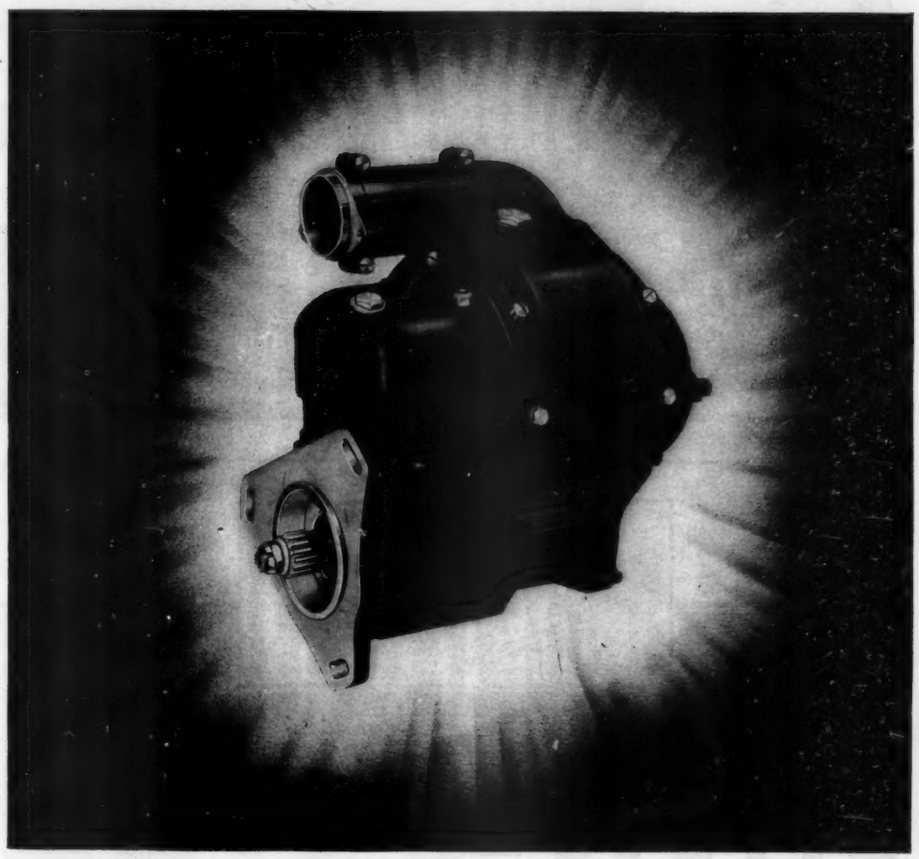
F. W. Michaux 27-A Pierce, 200 bbl., 5/32-in. choke, perf. casing 5,368-76 ft., T.D. 5,400 ft.

F. W. Michaux 41-A Pierce, 141 bbl., 5/32-in. choke, perf. casing 5,310-20 ft., T.D. 5,552 ft.

F. W. Michaux 48-A Pierce, 169 bbl., 5/32-in. choke, perf. casing 5,303-12 ft., T.D. 5,355 ft.

Texas 95-B Pierce, 76 bbl., ⅛-in. choke, sand 5,543-45 ft.

AIMING HIGHER



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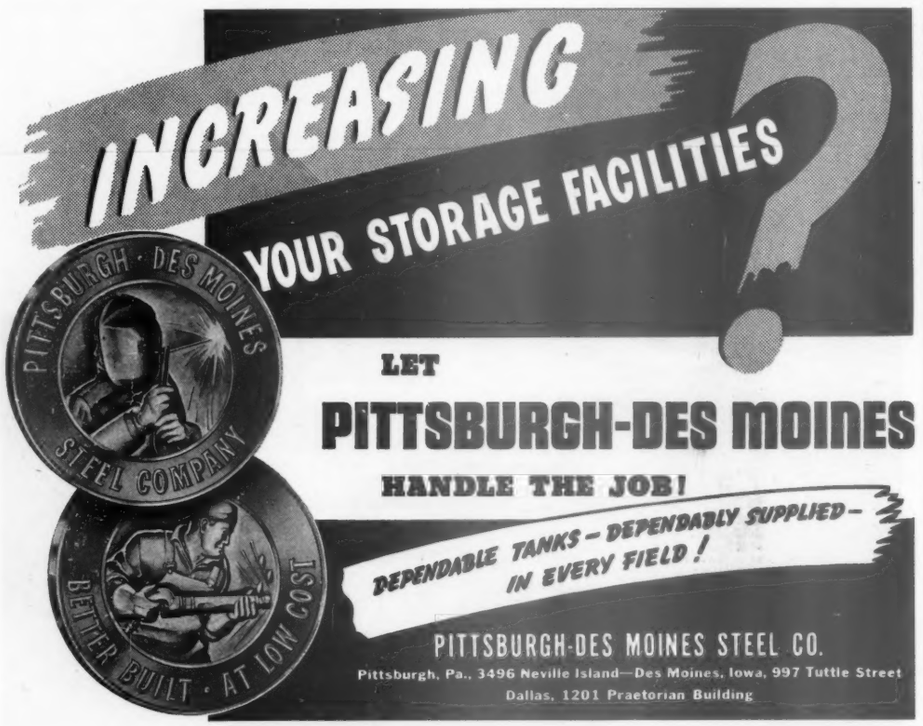
INDIANA, OHIO, KENTUCKY

Posey County Wildcat Has Production in Aux Vases

EVANSVILLE, Ind.—Sun Oil Co.'s 1 L. C. Byrd, NE SE 4-8s-14w, a wildcat in the southern part of Posey County, was swabbing a barrel of oil an hour late last week following a shot in the Aux Vases at 2,602-21 ft. Total depth of the test is 2,653 ft. in the McClosky.

Also in Posey County, the second and third prospective producers in the new field east of Mount Vernon were scheduled to drill plug early this week. They are Gulf Refining Co. 1 Frank Schutte, NE NW 8-7s-12w, where casing has been set at 2,602 ft. to test Aux Vases saturation at 2,607-11 ft. and Tide Water 1 Will Oeth, SW SW 5-7s-12w, where casing is set at 2,611 ft. with the Aux Vases pay at 2,619-24 ft.

In Hazelton area of Gibson County, Muter Oil Co. 1 Ewing, N½ Don. 99-1n-10w, was making about 10 bbl. of oil an hour natural from the McClosky at 1,785-89 ft. The well will probably be acidized before completion.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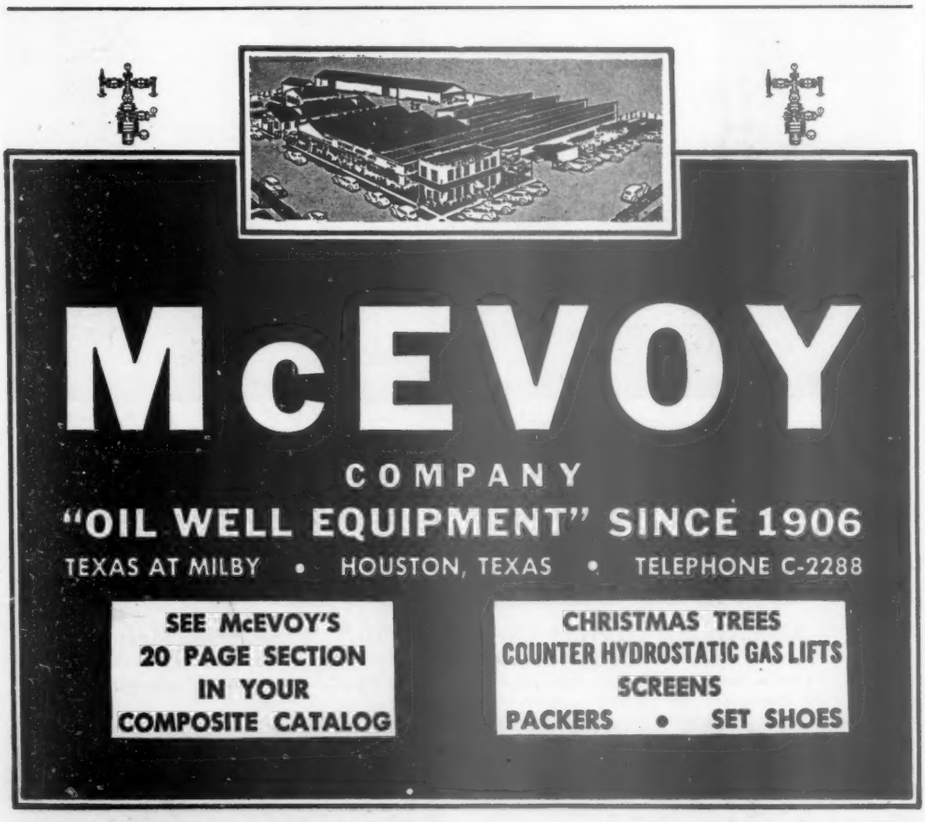
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OHIO

ZANESVILLE, Ohio.—A blanket exception has been granted for the Clayton pool (Pennsylvanian Grade) in Perry County under 214-A; 14 locations were made in the past week. The area included in this exception covers approximately 7,000 acres in Clayton, Reading, and Madison townships.

Successful completions consist mostly of small gas wells with Lorain County yielding the only one gaging better than a million cubic feet open flow. A total of 38 new tests were announced during the week.

OHIO COMPLETIONS

Athens County, Lodi Township: C. A. Cody 1 Clifford Smith, Fraction 17, 100,000 cu. ft. gas, shot, second Berea, T.D. 1,687 ft.
Carthage Township: Price Estate 1 C. M. Bradford Sec. 11, dry, T.D. 870 ft.
Gallia County, Addison Township: D. T. Orndoff 1 L. H. Nelson, Sec. 26, 30,000 cu. ft. gas, shot, second Berea, T.D. 1,709 ft.
Holmes County, Monroe Township: Ohio Fuel 1 J. A. Mitten, Sec. 29, 140,000 cu. ft. gas, shot, Clinton 3,507 ft.
Richland Township: Ohio Fuel 1 Bertha Jones, Sec. 5, 220,000 cu. ft. gas, shot, Clinton, T.D. 3,319 ft.
Knox County, Clay Township: Ross Riggs 1 L. J. Dugan, Sec. 20, dry, Clinton, T.D. 2,972 ft.
Union Township: Ohio Fuel 1 William McElroy, Sec. 17, 520,000 cu. ft. gas, Clinton, T.D. 2,854 ft.
Licking County, Hopewell Township: Hope Construction & Refining Co. 1 Thomas Hamilton, SW Sec. 23, 25 bbl., swabbed, Clinton, T.D. 3,085 ft.
Lorain County, Columbia Township: Ohio Fuel 1 P. Patterson, Lot 85, 1,150,000 cu. ft. gas, Clinton, T.D. 2,656 ft.
Meigs County, Rutland Township: F. Utsinger 3 Hurdie Nelson, Sec. 18, dry, Maxson (water), T.D. 850 ft.
Medina County, Westfield Township: Ohio Fuel 2 A. Fulton, Lot 34, dry, show gas, Clinton, T.D. 3,293 ft.
Chatham Township: Harry W. Patterson 1-H John F. Garver, Tract 13, Lot 5, 10 bbl., Berea, T.D. 395 ft.
Harry W. Patterson 2-H John F. Garver, dry, Berea, T.D. 380 ft.
Harry W. Patterson 3-H John F. Garver, 5 bbl. Berea, T.D. 380 ft.
Harry W. Patterson 4-H John F. Garver, 25 bbl., Berea, T.D. 396 ft.
J. S. Swan 3 Vernard L. Allis, Tract 6, Lot 3, 5 bbl., Berea, T.D. 433 ft.
Harrisville Township: J. S. Swan 1 Rosa M. Clark, Lot 5, input well, 399 ft.
J. S. Swan 2 Rosa M. Clark, input well, T.D. 410 ft.
J. S. Swan 3 Rosa M. Clark, east, input, T.D. 387 ft.
J. S. Swan 3 Rosa M. Clark, 45 bbl., Berea, T.D. 440 ft.
J. S. Swan 4 Rosa M. Clark, input, T.D. 409 ft.
Morgan County, York Township: C. A. Eppley, Sec. 27, 450,000 cu. ft. gas, Clinton, T.D. 4,280 ft.
Muskingum County, Salt Creek Township: Ohio Fuel Gas Co. 1 Geneva H. Young, SW Sec. 8, 1,000,000 cu. ft. gas, Clinton sand, T.D. 4,244 ft., Medina oil not tested.
Noble County, Jefferson Township: William Larrick et al 1 C. E. Snyder, Sec. 24, dry, Berea, T.D. 1,683 ft.
Sutton Township: Ray Proffitt et al 1 Otha Circle, Sec. 6, 100,000 cu. ft. gas, shot, Ohio shales, T.D. 3,486 ft.
Washington County, Barlow Township: R. W. Porter 1 M. Male, Sec. 1, dry, Keener (water), T.D. 1,345 ft.
Grandview Township: Consolidated Oil Co. 1 James Ruble, Sec. 35, dry, shale, T.D. 3,071 ft.
Henning Bros. 2 W. S. Laufer, Sec. 34, dry, Squaw, T.D. 1,854 ft.
Warren Township: H. W. Porter 1 F. Moore heirs, Sec. 3, 100,000 cu. ft. gas, Maxburg 800-ft. sand, T.D. 1,322 ft.

EASTERN KENTUCKY

ASHLAND, Ky., May 8.—Three gas wells were reported completed in eastern Kentucky this week with a combined daily open flow of about 1,330,000 cu. ft. of gas.

Reports from several areas indicate that a number of other wells are rapidly approaching completion depth. Some firms have reported new locations under the federal spacing regulations and are either moving onto location, setting or building rigs.

Floyd County: Kentucky-West Virginia Gas Co. 673 Chris Goble, Big lime, 400,000 cu. ft at 1,560 ft.
Kentucky-West Virginia Gas Co. 5392 J. M. Porter, Souders Creek, 103,000 cu. ft. of gas at 2,559 ft.
Knott County: Kentucky-West Virginia Gas Co. 5386 Taylor & Reed, Jones Fork, Maxon, 827,000 cu. ft. of gas at 1,745 ft.

LOUISIANA GULF COAST

New Deep Sand Found on Flank Of West Gueydan Field

By F. L. SINGLETON

NEW ORLEANS, La.—Although not officially completed, Pure 2 Vermilion Irrigation Co., a northeast outpost test in the West Gueydan field, Vermilion Parish, showed sufficient evidence to herald the opening of prolific production from a new and deeper sand for the structure. With the well bottomed at 11,000 ft., casing was perforated opposite sand at 10,792-97 ft., and the well flowed at the rate of 40 bbl. of pipeline oil per hour. However, after shutting the well in and changing the size of the choke to ⅛ in. it flowed at the rate of 23 bbl. of fluid per hour of which 7 to 70 per cent was salt water and the balance 35.7-gravity oil. Flowing pressure dropped from 1,350 lb. to 1,100 lb. An electrical survey is said to have logged the sand section from 10,776-99 ft., and no trouble in shutting off the salt water is anticipated. Production was opened on this structure in 1938, and while two sands produce from 6,600 and 7,000 ft., production is limited to a small area and the area has been void of any development during the past several months.

In the Lewisburg field, St. Landry Parish. Stanolind Oil & Gas Co.'s attempt to open production from a new and deeper sand in 1 Dohmann failed when 2,100 ft. of salt water and 735 ft. of salt water and oil was recovered on a production test through perforated casing at 10,685-10,720 ft. In view of the fact that details on this well have not been released it is not known whether sufficient sand has been logged to warrant another test in this section, or whether the well will be plugged back and tested at 10,200-10,300 ft. which is the approximate depth of the discovery pay. The well is located in 8-7s-3e, about 1 mile northeast of the field proper across the parish line in St. Landry Parish.

Show Reported in Terrebonne Parish Test

Humble 2 Continental Land & Fur Co., a projected deep test located in 24-18s-12e, Terrebonne Parish, was being watched with much interest due to a reported showing of oil logged in a shallow sand at 4,865-85 ft. The showing was indicated by mud analysis. The section was not cored and was logged as sandy shale. The well is drilling ahead in shale below 5,747 ft., and the section is not expected to be tested unless no shows are logged at deeper depths.

Approximately ¼ mile southwest of deep Wilcox sand production in the Neale field, Beauregard Parish, Atlantic Refining Co. was in the process of testing 1 Welborn, which is bottomed at 11,800 ft. where casing was cemented. Details as to where the well will be tested were not available, although the first test is expected to be made in a deeper sand section than the 10,900-11,000-ft. sand which produces in two wells. That the well is expected to be completed as a producer is indicated further by the staking of a new location, 1 Rice Land & Lumber Co., due west of 1 Welborn.

Although details were not available at the end of the week, Sugarfield Oil Co. 4 Richard Community is reported to have been completed for a producer to extend the newly opened deep sand several hundred feet. Drilled to a total depth of 9,696 ft., 5½-in. casing was cemented at 9,400 ft., and completion is said to have been made in sand at 9,388-9,415 ft. While the sand section was logged higher than the discovery well it is believed to be the same. This sand was found in January of this year and the completion of the second producer is expected to result in additional deep tests being drilled on the structure which produces mainly from two upper sands at 6,400 ft. and 6,700 ft.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

Terrebonne Parish: Pan American 1 La Terre Co., dry, T.D. 10,502 ft.

Fields

Bastian Bay, Plaquemines Parish: Phillips 1 Fasterling, 211 bbl. fluid, 90 per cent oil, 10 per cent salt water, ⅞-in. choke, perf. casing 9,013-22 ft., T.D. 10,006 ft.

Charenton, St. Mary Parish: George Frankos 1 Veeder, 10 bbl. pumping, perf. casing 3,066-76 ft., T.D. 4,101 ft.

Happytown, Iberville Parish: Shell 1 Iberville Land Co., dry, T.D. 11,012 ft.

Hayes, Calcasieu Parish: Gulf 2 Calcasieu National Bank, 53 bbl., 7/32-in. choke, perf. casing 11,660-70 ft., 11,646-56 ft., T.D. 11,848 ft.

West Lake Verret, St. Martin Parish: Shell 10 Jeanerette, 278 bbl., ⅛-in. choke, perf. casing 11,475-84 ft., T.D. 11,489 ft.

Lake Hermitage, Plaquemines Parish: Gulf 14 La Fourche Basin Levee district, dry, T.D. 5,505 ft.

New Iberia, Iberia Parish: William Helis 1 J. E. Schwing, dry, T.D. 2,525 ft.

Paradis, St. Charles Parish: Texas 21 Paradis, 519 bbl., ⅞-in. choke, perf. casing 10,324-34 ft., T.D. 10,443 ft.

Texas 24 L. L. and E. Paradis, 423 bbl., ⅞-in. choke, perf. casing 10,390-10,420 ft., T.D. 10,429 ft.

Point Au Fer, Terrebonne Parish: Texas 1 State Point Au Fer, 1,800,000 cu. ft. gas, 12/64-in. choke, perf. casing 5,608-30 ft., T.D. 9,264 ft.

Ritchie, Acadia Parish: Bering 2 McManus, 113 bbl., 10/64-in. choke, sand 3,490-3,508 ft., T.D. 3,508 ft.

Schooner Bayou, Vermilion Parish: Union Oil Co. of California 3-A Vermilion Parish School Board, 216 bbl., 5/32-in. choke, upper sand, 243 bbl., 10/64-in. choke, lower sand, perf. casing 6,415-20 ft., 5,964-82 ft., T.D. 6,440 ft., dual completion.

Venice, Plaquemines Parish: Tide Water 16 Manhattan Land & Fruit Co., dry, T.D. 9,052 ft.

Ville Platte, Evangeline Parish: Continental 9 Haas, 103 bbl., 12/64-in. choke, perf. casing 10,170-10,210 ft., T.D. 10,272 ft.

West Hackberry, Cameron Parish: D. D. Feldman 1 Lacy, dry, T.D. 3,700 ft.

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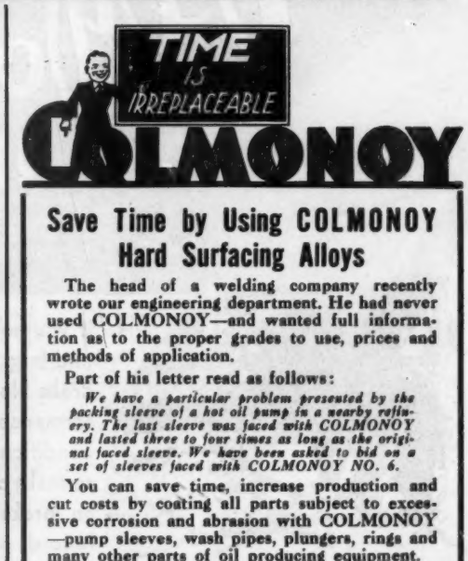
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KANSAS, NEBRASKA

Extensions and New Pay Follow Increased Activity

By CARL HOOT

KANSAS operators had a fairly successful week with 12 oil wells completed for total initial potential of 10,830 bbl. Three gas wells were added to the McLouth field of Jefferson County. On the negative side, however, 11 wells were dry, of which six were wildcats.

The Breford pool of Barton County was extended ¼ mile southwest by Luther Mackall 1-A Disque, NE corner 23-17-11w, which pumped 307 bbl. in 24 hours. Division lines between the Breford, Bloomer and Kraft-Prusa pools are becoming harder to distinguish, with a possibility of their merging into one area if materials are available for drilling.

Two miles west of the Burnett pool in Ellis County, J. H. Bloch 1 Haller, discovery well of the Haller pool, was deepened to a new pay zone in the Lansing-Kansas City lime at 3,215-3,227 ft. After setting casing, 2,000 ft. of oil rose in the hole. The Haller pool was originally completed in Topeka lime in 1936.

Peace Creek Trend Play Extended

Completion difficulties continue at Simpson Oil Co. 1-B Souder, a wildcat in SW NE NE 32-23-10w, 1 mile southwest of nearest production in the Peace Creek pool and prospective pool opener of southwest Peace Creek. When cement plug set in the Viola at 3,718 ft. was drilled, 2,500 ft. of oil rose in the hole. Top of Viola was originally found at 3,671 ft. and 5-in. casing was set at 3,674 ft. At 3,731 ft., 75,000,000 cu. ft. of gas was encountered and the hole was plugged back to 3,670 ft. to kill the gas. The acid treatments were given at this depth and the well flowed approximately 5 bbl. an hour for 2 hours. It was then plugged back to 3,023 ft. to straighten.

The Northeast Peace Creek pool was extended ¼ mile southeast by Cities Service 1 Sentney, NW NE 14-23-10w. The well made 3,000 bbl. state potential from Viola lime topped at 3,745 ft.

KANSAS COMPLETIONS

Wildcats

Barton County: Gulf 1 Steinert, NE NE SW 4-16-15w, dry, T.D. 3,555 ft., Topeka 2,939 ft., Lansing 3,223 ft., conglomerate 3,470 ft., Arbuckle 3,526 ft.

McPherson County: Phillips 1 Flo, S½ NE SE 29-17-1w, dry, T.D. 2,745 ft., Topeka 1,555 ft., Lansing 2,080 ft., Mississippi lime 2,655 ft.

Norton County: Rine Drlg. 1 Wallack, NE NW 22-2s-23w, dry, T.D. 3,733 ft., Lansing 3,444 ft., Arbuckle 3,690 ft., granite 3,706 ft.

Rice County: Herndon Drlg. 1 Wellman, SW cor. 20-21-9w, dry, T.D. 3,555 ft., Florence 1,570 ft., Wreford 1,650 ft., Lansing 2,958 ft., Kinderhook 3,278 ft., Viola 3,408 ft., Simpson 3,464 ft., Arbuckle 3,522 ft.

Russell County: Colorado Pet. 1 Berrick, N½ NE NW 13-15-13w, dry, T.D. 3,280 ft., Lansing 2,923 ft., conglomerate 3,219 ft., Arbuckle 3,228 ft.

Saline County: Harwood & Appleman 1 Schwartz, S½ SW SE 13-16-1w, dry, T.D. 2,677 ft., Lansing 2,005 ft., Mississippi lime 2,655 ft.

Fields

Beaver, Barton County: Gulf 1 Bushnell, S½ SW NE 18-16-12w, pumped 149 bbl., Topeka 2,703-2,963 ft., T.D. 3,319 ft., acid.

Breford, Barton County: Luther Mackall 1-A Disque, NE cor. 23-17-11w, pumped 307 bbl., Arbuckle 3,310-28 ft., T.D. 3,330 ft., acid and shot.

Chase, Rice County: Lauck & Moncrief 1 Six, N½ NE NW 27-19-9w, pumped 231 bbl., Arbuckle 3,208-11 ft., T.D. 3,216 ft.

Dayton, Phillips County: Carter Oil 2 Garber, SW SW 36-2-19w, pumped 778 bbl., Lansing-Kansas City 3,143-3,320 ft., T.D. 3,348 ft.

Dopita, Rooks County: Phillips and Continental 1 Henruss, NE NW 31-8-17w, pumped 149 bbl., Arbuckle 3,396-3,403 ft.

Geneseo, Rice County: Continental 6-A Ainsworth, SW NE NW 30-18-7w, pumped 554 bbl., Arbuckle 3,180-83 ft.

Hendrickson, Reno County: Lion Oil Ref. 2 Phillips, SE SE NE 2-23-10w, 1,959 bbl., flowed 30 bbl. an hr. through choke, cherty Viola 3,715-28 ft.

Kraft-Prusa, Barton County: W. W. Drlg. 2 Kraft, S½ SW NW 36-16-11w, dry, T.D. 3,420 ft.

Gulf 1 Standinger, SE SE 7-16-11w, pumped 277 bbl., Arbuckle 3,284-91 ft.

Layton, Rooks County: Broadview 2-E Baxter, S½ SW NE 3-9-16w, pumped 431 bbl., Lansing-Kansas City 3,116-60 ft., T.D. 3,169 ft.

McLouth, Jefferson County: Sherrod et al 1 Benne. NW NW NE 8-10-20, 2 bbl., McLouth sand 1,516-32 ft., T.D. 1,623 ft., shot.

McLaughlin et al 2 Zachariah, SE NE 20-9-20, 8,400,000 cu. ft. gas, McLouth 1,358-71 ft.

O. J. Connell 1 Mosberger, NW SE 21-9-20, dry, T.D. 1,538 ft., McLouth 1,445 ft., Mississippi lime 1,460 ft.

Hatcher-Fisk, Ltd., 1 Bower, NE SW 5-10-20, 6,250,000 cu. ft. gas, McLouth 1,527-44 ft.

McLaughlin 2 McLeod-Wisdom, SW NW 8-10-20, 5,775,000 cu. ft. gas, McLouth 1,528-53 ft.

Peace Creek, Northeast, Reno County: Cities Service 2 Estey, NE NW 14-23-10w, 3,000 bbl., flowed 26 bbl. an hr., Viola 3,746-55 ft.

Peace Creek, Northeast, Reno County: Cities Service 1 Sentney, NW NE 14-23-10w, 3,000 bbl., Viola 3,745-48 ft., acidized.

Miscellaneous

Cowley County: Arthur Brewer 1 Coulson, SE SW SW 33-33-3, dry, T.D. 3,350 ft.

Jefferson County: William Smyth 1 Federal Land Bank, SW NE 29-9-20, dry, T.D. 1,534 ft., Bartlesville 1,534 ft., swabbed 1 bbl. an hr.

Rice County: Westgate Greenland 3 Hodges, S½ SW NE 25-20-6w, dry, T.D. 3,279 ft.

FOREST CITY BASIN

ST. JOSEPH, Mo.—Skelly Oil Co. was waiting to drill cement plug at 1 George W. Wiltse in the Dawson pool of Richardson County, Nebraska, E½ NW SE 10-1n-14e. If this test pays it will be the first Wilcox sand producer for the state. The sand was topped at 3,230 ft. and the company reported 3 ft. of saturation. Above that, in the Simpson lime, there was another show, which likewise is to be tested.

In the same pool, Brown & Clampitt were drilling at 3,057 ft. at 1 A. B. Cornelius in E½ SE NE 4-1n-14e. Wilcox sand is to be tested there also. Viola lime was topped at 2,930 ft.

MISSOURI COMPLETIONS

Clinton County: Hendricks et al 1 Estep, NE SE SW 27-56n-30w, T.D. 578 ft., dry hole.

Platte County: G. E. Webb 1 fee, SW NE NW 17-51n-33w, T.D. 620 ft., dry hole.

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SOUTHWEST TEXAS

Hockleyensis to Be Tested in Bee County Wildcat

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—Bee County, the scene of considerable wildcatting during the past 2 months, had promise of another new field as testing was under way at Lonnie Glasscock 1 Holzmark, located 5 miles southeast of Mineral in the J. A. York Survey. This well cored salt water sand in the Pettus section at 4,080-96 ft., and 7-in. casing was cemented at 3,425 ft., preparatory to testing sand in the Hockleyensis formation at 3,487-3,535 ft.

In the meantime, I. K. Howeth 1 Homer Harris, a new gas discovery 9 miles west of Beeville was officially gaged at the rate of 14,000,000 cu. ft. of gas daily through open 2-in. tubing with a slight show of distillate. The well was completed in the Hockleyensis sand at 3,734-37 ft. Total depth is 4,717 ft.

Locations for two new wells were announced for the South Caesar field, Bee County. They are Continental 1 J. E. Fox in the NW cor. of the P. B. McEarly Survey, which will be an important outpost located several hundred feet southeast of Luling Oil & Gas Co. 1 Grissom. Tide Water Associated Oil Co. made tentative location for 1 J. J. Grissom, 1,375 ft. southwest of Atlantic 2 Grissom. The latter well is drilling below 5,600 ft., and the Tide Water location is not expected to be drilled until the Atlantic test reaches its objective. In the meantime, the first dry hole was recorded for the structure with the abandonment of Jay Simmons 1 Cotton, 5,000 ft. northeast of the discovery well, and 3,000 ft. southeast of the Luling producer. Total depth is 6,632 ft., and only 11 ft. of sand with a slight showing was logged in the 6,500-ft. pay.

Carrizo-Wilcox Test Dry in Bee County

The search for Carrizo-Wilcox production in the county was discouraged to some extent with the abandonment of Tide Water 1 Hall, 2 miles northwest of Tuleta in the J. Williams Survey at a total depth of 7,881 ft. Tight sand with an oil odor was reported cored at 7,649-66 ft., but the saturation was not sufficient to warrant testing. However, in view of this showing and its relation to the West Tuleta field in which two wells are producing gas-distillate from the Carrizo, additional development can be expected to be drilled in the immediate area.

Along this same trend, exploration for Carrizo-Wilcox sand production was increased with the announcement of two new locations in Bee and De Witt County. Two miles west of Berclair, Magnolia Petroleum Co. has derrick up for 1 E. H. Buckner in the Thomas Simons Survey, while in De Witt County, and 5 miles south of Nordheim, Tide Water Associated Oil Co., Seaboard Oil Co., and Adams Oil & Gas Co. are preparing to drill a wildcat on the F. G. Gips lease in the Willis A. Moore Survey.

In southwestern McMullen County, Quintana 1-C South Texas Syndicate cored sand with an oil odor at 3,955-65 ft., but a drill-stem test of the section recovered 1,620 ft. of salt water with a show of dead oil, and the well is drilling ahead in sandy shale below 4,522 ft. This is a projected Wilcox test located in the B.S.&F. Survey 25.

Along the Balcones fault line and located 4 miles north of Dale and 2 miles northeast of the Riddle field, Bastrop County, Ogden & Riddle were testing 3-B Riddle. Total depth of the well is 1,933 ft. in Austin chalk and 5½-in. casing was cemented at 1,752 ft. preparatory to testing the Dale lime which carried an oil show at 1,777-85 ft. and 1,883-93 ft. Top of the Austin chalk was 1,928 ft.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Wildcats

Calhoun County: Stanolind 5 Welder, dry, T.D. 6,100 ft.
Jim Wells County: Humble 1 Mull, dry, T.D. 8,115 ft.
Nueces County: L. A. Douglas 1 Allen, dry, T.D. 7,513 ft.
Refugio County: Hewitt & Dougherty 16 Rooke, dry, 7,151 ft.
Willacy County: Sunray 1 Karlin. dry, T.D. 8,307 ft.

Fields

Agua Duce, Jim Wells County: Richardson 1-B Union Central Life Insurance Co., 173 bbl., ⅛-in. choke, perf. casing 7,090-96 ft. and 7,101-7 ft., T.D. 7,114 ft.
Renwar 3 Knight, 121 bbl., 7/64-in. choke, perf. casing 7,180-85 ft., T.D. 7,230 ft.
Cologne, Victoria County: Catahoula Oil & Gas Co. 1 Dietzel, 94 bbl. oil, 10 per cent salt water, 7/64-in. choke, perf. casing 4,829-32 ft., T.D. 4,850 ft.
Odem, San Patricio County: Seaboard 4 Welder, 130 bbl., 3/32-in. choke, perf. casing 5,265-68 ft., T.D. 5,383 ft.
Seaboard 5 Smith, 114 bbl., ⅛-in. choke, T.D. 5,452 ft.
Seaboard 1 Burrows, 133 bbl., ⅛-in. choke, T.D. 5,433 ft.
Richard King, Nueces County: Southern Minerals 26 King, 75 bbl., 7/64-in. choke, perf. casing 5,375-85 ft., T.D. 5,672 ft.
Southeast Orange Grove, Jim Wells County: Plymouth 1 J. J. Kuck, 750,000 cu. ft. gas, 7/64-in. choke, perf. casing 5,079-85 ft., T.D. 5,828 ft.
Stratton, Jim Wells County: Humble 13 King, 155 bbl., ⅛-in. choke, T.D. 6,650 ft.
Southern Minerals 39 Stratton, 78 bbl., 7/64-in. choke, T.D. 6,648 ft.

LAREDO DISTRICT

Wildcats

Live Oak County: Humphries & Hotchkins 1 Telford, dry, T.D. 1,900 ft.

Fields

Colorado, Jim Wells County: Sun 3-B East, 8 bbl., pumping, T.D. 2,833 ft.
Yturria, Starr County: Sun 1 Semano, dry, T.D. 4,882 ft.

SOUTH CENTRAL TEXAS DISTRICT

Fields

Bee Creek, Caldwell County: Ralph Ogden 14 Talley, 18 bbl. oil plus 10 per cent salt water, T.D. 2,286 ft.

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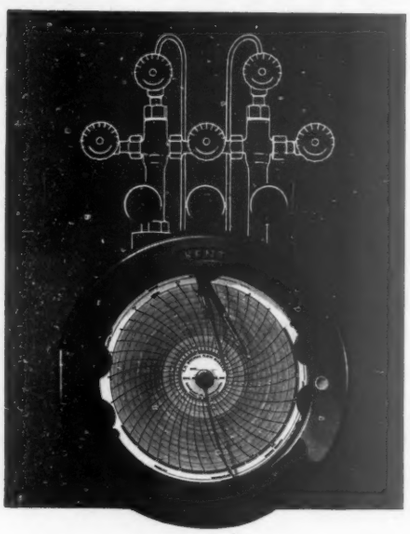

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MICHIGAN OPERATIONS

Evart Gas-Field Test Shows Oil in Dundee

By OTTO C. PRESSPRICH

SAGINAW, Mich.—While another gusher in the Adams-Arenac pool excited operators and more big wells were developed in the Reed City and Headquarters field during the past week, chief center of interest in Michigan oil operations was in the Evart gas field where a Sun Oil Co. producer offered the possibility of another new pool.

The Sun 1 Arndt, a wildcat test in Section 23 of Osceola Township, Osceola County, where Taggart Brothers Co. last week completed two more gas wells, was reported swabbing up to 50 bbl. a day. A wildcat test, the hole was drilled to 3,778 ft., into the Dundee, and it was planned to acidize the hole. Sun Oil holds most of the acreage.

The big Adams well is the Ervin Major 1 Ellison, in Section 27, which flowed in excess of 200 bbl. an hour. It is 3 miles west of Major's 1 Adams, which was brought in 2 months ago as the state's first big Monroe producer below 4,200 ft.

Twenty completions were recorded for the week, 15 being oil wells. The three dry holes were wildcat tests. Initial potential of the new oil producers was 16,650 bbl. a day, six of the wells, in addition to the Ellison gusher, producing initially all the way from 1,488 to 2,880 bbl. a day. Four locations were abandoned.

Activities increased in Riverside Township, Missaukee County, with at least a half-dozen tests under way on the heels of the Turner Petroleum Co. 1 Cavanagh discovery in Section 14.

MICHIGAN COMPLETIONS

Allegan County, Casco Township: Clapsaddle & Harris 1 Porter et al, NE SE NE 24-1n-16w, wildcat, location abandoned.

Hopkins Township: Fisher-McCall Oil & Gas, Inc., 2 Wamhoff, NE NE NW 18-3n-12, pumping 96 bbl. and salt water, acidized, T.D. 1,591 ft.

Regal Dutch Petroleum Co. 1 Nicolai, NW SE NE Sec. 18, pumped 100 bbl. first 16 hr., acidized, T.D. 1,545 ft.

Lee Township: A. W. Winchester 1 Schley, SW NE NW 19-1n-15w, wildcat test, dry, T.D. 1,183½ ft.

Trowbridge Township: John F. Burton 2 Waterman, NE SE SE 30-1n-13w, pumping 40 bbl. and salt water, acidized, T.D. 1,371 ft.

Valley Township: Fisher-McCall Oil & Gas, Inc., 1 Moore, NW NE SE 12-2n-14w, wildcat test, dry, T.D. 1,490 ft.

Arenac County, Adams Township: Don Rayburn-Ervin Major 4 Kerr, SE NE NE 22-19n-3e, location abandoned.

Don Rayburn 1 Shearer, SW NE SE Sec. 23, pumping 16 bbl. and salt water, acidized, T.D. 3,002 ft.

Ervin Major 1 Ellison, NE NE NW Sec. 27, natural potential 5,284 bbl., T.D. 2,912 ft.

Clayton Township: Don Rayburn 2 Hobart, NE NE NE 19-20n-4e, pumping 15 bbl., acidized, T.D. 4,163 ft.

Bay County, Monitor Township: Gulf Refining Co. 1 Leonard, C S½ NE NW 3-14n-4e, pumping 43 bbl., acidized, T.D. 2,967 ft.

Clare County, Franklin Township: Pure Oil Co. 1 Bonninghausen, W-NE frl. 4-20n-3w, natural initial potential 2,367 bbl., T.D. 3,361 ft.

Mecosta County, Deerfield Township: Belvidere Oil Co. 1 Hand communitized, SW SE SE 4-13n-9w, wildcat test, dry, T.D. 1,356 ft.

Osceola County, Lincoln Township: Pure Oil Co. B-1 Richards, C S½ NW NE 19-18n-10w, producing 65 bbl. an hr., acidized, T.D. 3,609 ft.

Gulf Refining Co. 1 McIntire, C N½ SW SE Sec. 32, natural initial potential 1,488 bbl., T.D. 3,579½ ft.

Osceola Township: Taggart Bros. Co. 6 Swales-Somers, C SW 26-18n-8w, natural gas, 214,000 cu. ft. daily, T.D. 1,355 ft., P.B. from 1,376 ft.

Taggart Bros. Co. 8 Wilcox-Becker et al, C NW Sec. 27, natural gas, 2,190,000 cu. ft., T.D. 1,398 ft., P.B. from 1,406 ft.

Richmond Township: Gulf Refining Co. 1 Bregg, C N½ NW SW 5-17n-10w, initial natural potential 1,584 ft., T.D. 3,609 ft.

Roscommon County, Richfield Township: Sun Oil Co. 1 St. Helen resort, C S½ SW SW 21-24n-1w, flowing 50 bbl., acidized, T.D. 4,197 ft.

Roscommon Township: Ohio Oil Co. A-5 State, C N½ SW SE 33-21n-3w, natural initial potential 2,880 bbl., T.D. 3,365 ft.

Sun Oil Co. A-3 State, C N½ SE SW Sec. 33, natural initial potential 2,040 bbl., T.D. 3,328 ft.

Van Buren County, Bloomingdale Township: George L. Kernodle 1 Skillman, NW SE NW 12-1s-14w, pumping 36 bbl. and salt water, acidized, T.D. 1,278 ft.

OKLAHOMA FIELD REPORT

Pawnee County Discovery Opens New Wilcox Pool

By CARL HOOT

COMPLETIONS the past week in Oklahoma were of little consequence except for one pool extension in Pottawatomie County. There were 9 dry holes, which included 1 input and 1 disposal well; 1 small gasser and 11 abandoned locations. On the brighter side, however, was the discovery well in Pawnee County.

Nowthwest of Pawnee in Pawnee County, Alma Oil Co. 1 Deroin, SE NW NW 25-23-3, flowed 436 bbl. of oil and 15,000,000 cu. ft. of gas from Wilcox topped at 3,880 ft. Previous to the test, Schlumberger was run which logged 13 oil shows. Seven-inch casing was set at 3,810 ft. and total depth was 3,891 ft. Completion tests will be made after pipe line is laid to the well. Gulf Oil Co. was reported to be making pipe connections.

Pottawatomie County Pools Joined

The West Earlsboro and Hotulke pools of Pottawatomie County were linked with the completion of Anderson-Prichard 2 White, NW NW 30-9-5. Initial production was 731 bbl. from the Hunton at 4,126-74 ft. It extends the Earlsboro field ¼ mile south. The well may be considered a ¼-mile extension to the Hotulke field which has been active since its discovery in May 1941, but the two fields are separated by the township line.

Six miles southwest of the Hotulke field, Mid-Continent Petroleum had showings for a small producer at its 1 Caldwell, a wildcat in NW SE NE 1-8-3. Drilled to 5,157 ft. in the second Wilcox, the hole was plugged back to Hunton and 7-in. casing set at 4,912 ft. Best show was found in Hunton at 4,530-4,674 ft. The well flowed 3 bbl. of oil an hour and was shut in for tanks.

OKLAHOMA COMPLETIONS

Wildcats

Garvin County: Henry Mode 1 Hunt, NE SE 29-4-1w, abandoned location.

Lincoln County: Hubbell et al 1 Creiss, NE SW 2-14-6, abandoned location.

Muskogee County: Metzger & Foltz 1 Dodson, N½ NE SE 22-14-18, dry, T.D. 1,422 ft., sand.

Payne County: Jones 1 Summer, NW SW SW 6-18-3, abandoned location.

Seminole County: Big Chief 1 Crauch, N½ NE SE 29-8-7, dry, T.D. 4,311 ft., Cromwell 3,305 ft., Mayes 3,890 ft., Woodford 3,995 ft., Misener and Hunton 4,087 ft., Wilcox 4,299 ft.

Fields

Apache, Caddo County: Texas 6 Mulkehay, NE SE SE 2-5-12w, dry, T.D. 5,607 ft., Viola 2,241 ft., sand 4,860 ft.

Beebe, Pottawatomie County: Farmers Mutual 2 Waite, SE NW SE 9-5-5, dry, T.D. 2,685 ft.

Earlsboro, West, Pottawatomie County: Anderson-Prichard 2 White, NW NW 30-9-5, flowed 731 bbl., Hunton 4,126-74 ft., T.D. 4,304 ft.

Guthrie, Logan County: McBride 8 Eastwood, NW SW SW 7-17-1w, abandoned location.

Lovell, Logan County: Champlin 1 Lovell, NW NE 16-18-4w, dry, T.D. 3,414 ft.

Loco, West, Stephens County: Raizen Bros. 2 Lowery, NW NE SW 6-3s-5w, pumped 30 bbl., limestone 1,115-39 ft., T.D. 1,797 ft.

Oklahoma City, Oklahoma County: C. C. Peppers 1, Blk. 2, SE SW SW 27-12-3w, abandoned location.

St. Louis, Pottawatomie County: Commercial Drlg. 2 Walgreen, SE SW SW 4-7-4, pumped 10 bbl., Dense 4,180-4,259 ft.

Tonkawa, Kay County: Robert Clark 1 School land, SW NW 36-25-1w, abandoned location.

Miscellaneous

Creek County: Mid-Continent 1 Nancy, NE SW 16-15-7, dry, T.D. 3,992 ft.

T. C. Greer 2 Wright, SW SW SE 17-17-8, abandoned location.

Tibbens 4-A Harry, NE NW NW 9-14-10, abandoned location.

Gulf 33 Berryhill, SE NW NE 17-17-12, input well, T.D. 1,595 ft.

Osage County: McMiller 9, NW NE NE 23-25-10, dry, T.D. 1,766 ft.

Phillips 1-W Osage, NW SE SW 18-27-8, disposal well, T.D. 1,535 ft.

Okfuskee County: C. W. Titus 1 Simmer, SW SW NW 6-10-9, abandoned location.

Pawnee County: Sinclair Prairie 38 Jones, SE NW 20-21-8, pumped 3 bbl., Bartlesville 2,325 ft., T.D. 2,518 ft.

Seminole County: Harry Diamond 1 Jackson, SE SE NW 22-7-7, abandoned location.

Eason & Grisso 1-A Diament, SE SE 12-6-7, 330,000 cu. ft. gas, sand 1,188-95 ft., T.D. 1,245 ft.

J. V. Horner 1 Harris, NE SW NE 12-6-7, abandoned location.

Illinois Fields

(Continued from Page 110)

Tar Springs 2,577 ft., Glen Dean 2,609 ft., Hardinsburg 2,713 ft., Golconda 2,768 ft., Barlow 2,880 ft., Cypress sand 2,938 ft., Paint Creek 3,039 ft., Benoist 3,065 ft., Renault 3,134 ft., Aux Vases 3,221 ft., Ste. Genevieve 3,251 ft.

North Carlinville, Macoupin County: J. S. Pummell 1 Monetti, NE NE SE 20-10n-7w, dry at 527 ft., Pottsville 444 ft.

Plainview, Macoupin County: R. A. Thompson 1 Ganey, NW SW SE 35-9n-8w, dry at 400 ft.

Roland, White County: Fisher Oil 1 Welch, SW SW SW 11-7s-8e, pumped 60 bbl., 60-qt. shot 2,887-2,930 ft., 206-qt. 2,923-30 ft., old well worked over, T.D. 2,930 ft.

Rural Hill, Hamilton County: Kewanee et al 6-B Culivar, NE NE SW 14-6s-5e, flowed 137 bbl., perf. 3,248-58 ft., 3,180-3,204 ft., 1,500 gal. acid, reacidized 2,500 gal., Levias 3,186-99 ft., T.D. 3,279 ft., P.B. 3,235 ft.

Kewanee Oil 1 G. W. Dial, NW SW NE 22-6s-5e, salt-water disposal well, completed in Tar Springs and Palestine, Aux Vases 3,174 ft., Levias 3,247 ft., T.D. 3,324 ft., P.B. 3,268 ft.

Salem, Marion County: Big Chief Drlg. 1 Boles, W½ SW NW 15-1n-2e, pumped 48 bbl., Fredonia 2,096 ft., pay 2,077-83 ft., T.D. 2,125 ft., P.B. 2,065 ft., cleaned out to 2,085 ft.

Sims, Wayne County: N. V. Duncan 1 Withrow, W½ NW NW 28-1s-6e, flowed 442 bbl., 3,000 gal. acid, McClosky 3,157-61 ft., 3,176-83 ft., T.D. 3,189 ft.

Texas 4 H. Fuhrer, W½ SE SE 28-1s-6e, pumped 329 bbl., perf. 3,090-96 ft., 3,147-54 ft., 3,000 gal. acid, Levias 3,090-96 ft., McClosky 3,148-56 ft., T.D. 3,172 ft.

Walpole, Hamilton County: Texas 1 M. A. Smith, W½ NW NW 35-6s-6e, pumped 189 bbl., 10-qt. shot 3,095-3,100 ft., Aux Vases 3,082 ft., T.D. 3,100 ft.

West Clay City, Clay County: Pure 1 F. G. Cooper, SW SE 3-2n-7e, pumped 41 bbl., 1,000 gal. acid, McClosky 3,074-78 ft., T.D. 3,117 ft.

Pure 1 Bozart, SW NW 11-2n-7e, dry at 3,095 ft., Glen Dean 2,515 ft., Barlow 2,688 ft., Paint Creek 2,894 ft., Benoist 2,901 ft., Ste. Genevieve 3,010 ft., McClosky 3,070 ft.

Pure 2 Dobbs, N½ SW SW 10-2n-7e, pumped 41 bbl. oil and 14 bbl. water, 5,000 gal. acid, McClosky 3,082-83 ft., 3,111-20 ft., T.D. 3,135 ft.

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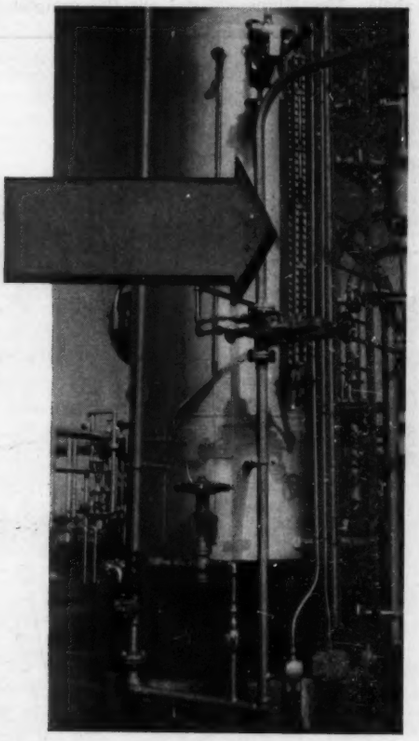

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ROCKY MOUNTAIN AREA

Tensleep Discovery Well at Pilot Butte Is Good Pumper

By T. R. INGRAM

DENVER, Colo.—The Superior Oil Co. 1 Tribal, a discovery in the Tensleep horizon in the Pilot Butte field, Fremont County, Wyoming, averaged 750 bbl. daily on a 2-day pumping test at the conclusion of which it was shut in for additional storage. It was a joint operation with the British American Oil Producing Co. A sample of the crude tested 24.7 gravity A.P.I. scale, but is expected to show up better when the oil is cleaned. It was still making a little drilling mud with the oil when the sample was taken.

Pilot Butte was discovered in 1916 when its first well was brought in at 1,255-1,306 ft. in shale. The Kinney-Coastal Oil Co. completed a well in 1930 in the Muddy sand at 3,362 ft. gaging 81,000,000 cu. ft. Location was in the SE SW Section 22, and the following year drilled in a smaller gas well in the same horizon ½ mile to the northeast. The Superior discovery well in the Tensleep is a mile to the north of the big gasser and ½ mile northwest of the second well. Completion record is given at the end of this report.

Sinclair-Wyoming 24-A Wertz, Wertz field, Wyoming, is an outside well in the Tensleep on southwest side of the field and a little less than half a mile southwest of the Tensleep discovery. It is outside the productive area of the Dakota sand contour but two wells on the north side were productive on lower contours, indicating that the Tensleep will be productive on the same contour entirely around the dome. It flowed 480 bbl. in 24 hours.

Continental Oil 4 Rodeo-1, SW SW SE 27-36-65, an outside well in the Sundance sand at the north of East Lance Creek, swabbed 10 bbl. a day at 4,078 ft., but upon drilling deeper to 4,129 ft. water came in and it swabbed 3 bbl. an hour. It is in the district in which drilling was suspended pending outcome of litigation in which the Government claimed title to the land. As a result of congressional action last year, the title situation was cleared up and drilling was resumed in that area a few months ago. It may be deepened to the Leo horizon in which producing wells have been completed to the west and southeast.

Three new operations were started in Cut Bank following approval of spacing pattern by the War Production Board. It had previously been approved by OPC, but the U. S. Geological Survey was reported to have held up individual locations until the pattern had the approval of WPB. Pattern wells are southeast of the forty.

WPB also has approved a 20-acre spacing program for Kevin-Sunburst, allowing locations 330 ft. back from property line and at least 900 ft. from any well drilled since December 23, 1941.

Wildcat operations are showing a decidedly upward trend. The Superior Oil Co., Continental Oil Co. and Union Oil Co. of California will join this summer in a test on the Douglas Creek structure, Rio Blanco County, Colorado. It is located 15 miles southeast of the Rangely field. All three companies have done extensive geological work in the area.

Sinclair-Wyoming has released a location for its 1 Anderson, SE SE SE 14-25n-89w, Sherrard dome, Carbon County, Wyoming, 3½ miles northwest of its Mary Carter, a recent gas discovery which made 8,000,000 cu. ft. in the Dakota after plugging back from the Tensleep. Spotting of the well followed a seismograph survey after the well to the southeast was completed. It will go to the Tensleep.

General Petroleum No. 34, SW SE NW 15-24n-66w, a wildcat on Antelope Gap, Platte County, Wyoming, is drilling water well and getting ready to spud.

General Petroleum also is getting ready to drill the South Cole Creek dome between the Cole Creek and Big Muddy fields, Wyoming. Location is NW SW SW 17-34n-76w.

Carter Oil Co. will drill 1 Semling, C SE SE 18-141n-81w, Woganport district, Burleigh County, North Dakota. It will go to the pre-Cambrian at around 7,500 ft.

WYOMING COMPLETIONS

Byron field, Big Horn County: Ohio Oil Co. 1-B Hoskins, CEL SW SE 15-56n-97w. T.D. 5,550 ft., 7-in. 5,516 ft., top Embar 5,335 ft., top Tensleep 5,445 ft., 300 bbl.

Mahoney dome, Carbon County: Sinclair-Wyoming 3-A Mahoney, C NW NE 34-26n-88w. T.D. 4,694 ft., P.B. to 4,568 ft., shot with 20 qt. at 4,397-4,513 ft., swabbed 50 bbl. from Tensleep, top 4,351 ft.

Sinclair-Wyoming 4-A Mahoney, C SW NE 34-26n-88w. T.D. 4,560 ft., 7-in. 4,384 ft., top Tensleep 4,386 ft., shot 320 qt. at 4,515-4,397 ft., swabbed 150 bbl.

Oregon Basin field, Park County: Enalpac Oil & Gas 4 Sarah, NW SE SE 32-51n-100w. T.D. 3,688 ft., top Embar 3,371 ft., Tensleep 3,650 ft., pumped 325 bbl.

Texas Co. 2 Freeman NE NW SE 20-51n-100w. T.D. 3,867 ft., 7-in. 3,852 ft., acid, 500 gal., swabbed 561 bbl. in 19 hr. from Embar-Tensleep.

Pilot Butte field, Fremont County: Superior Oil-British American 1 Tribal, SW SE SW 15-3n-1w. T.D. 6,775 ft., P.B. 6,446 ft. after testing Amsden, perf. opposite Tensleep at 6,184-6,325 ft., averaged 750 bbl. daily two-day test, then shut in for storage. (See lead.)

Wertz field, Carbon County: Sinclair-Wyoming 24-A Wertz, NW NW SW 7-26n-89w. T.D. 6,007 ft., 7-in. at 5,757 ft., on top Tensleep. Flowed 480 bbl.

MONTANA COMPLETIONS

Cut Bank field, Glacier County: Glacier Production 11 Bonnet, C NE SE 33-33n-5w. T.D. 2,954 ft., 7-in. 2,925 ft., Sunburst 2,822-75 ft., show oil 2,857-75 ft., Cut Bank 2,933-54 ft., main pay 2,945-54 ft., swabbed 203 bbl.

Glacier Production 6 Corrigeux, CWL NW SE 28-33n-5w. T.D. 3,072 ft., 7-in. 3,040 ft., show oil in Sunburst at 2,970-95 ft., and dry at 3,006-25 ft., Cut Bank 3,035-71 ft., main pay 3,057-71 ft., swabbed 91 bbl., shot 80 qt.

NORTHWEST NEW MEXICO COMPLETIONS

Hospah field, McKinley County: Petroleum Products 19 State, CEL SW SE 36-18n-9w, pumped 14 bbl., Hospah sand, 1,586-1,611 ft.

Petroleum Products 20 Hospah, NE NW NW 1-17n-9w. T.D. 1,587 ft., pumped 35 bbl. initial from Hospah sand.

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NORTH CENTRAL TEXAS

Cisco Sand Discovery May Open First Coke County Pool

By ROBERT INGRAM

FORT WORTH, Tex.—About midway between the oil fields of the Permian basin and the production of West Central Texas in Coleman, Callahan and Taylor counties, William F. Morgan of Houston, Tex., opened what appeared last week to be commercial production. The well was 1 J. S. Craft, 3 miles southwest of Blackwell, in Coke County, which has not other oil field.

Pumped for 3 hours at midweek for the purpose of removing acid water, the well recovered 52 bbl. of oil and 6 bbl. of acid water. It flowed briefly after pumping stopped. Fifty-two inches of fluid was placed in a 100-bbl. water tank, no oil storage being available, and no pumping test was expected until this week.

Oil was coming from the Cisco section of the Pennsylvanian lime at 3,820-28 ft., total depth. It was a sweet oil estimated at 40 gravity or better and was free from formation water. Thickness of the pay was indefinite, since only about 4 ft. of porous, saturated lime had been found in the middle 7 ft. of a core from 3,817-28 ft.

Five-and-one-half-inch casing had been set at 3,818 ft., and after plugs were drilled, the well was treated first with 500 gal. of acid, then, 2 days later, with 5,000 gal. of acid under pressure. It then swabbed some 60 bbl. of oil an hour for 4½ hours and estimates of the potential were placed at from 150 to 200 bbl. daily.

The well is 660 ft. out of the NE cor. of Section 276, Block 1-A, H.&T.C. Survey. It is a diagonal southwest offset to Mid-Kansas 1 W. E. Lackey, which filled 2,300 ft. with oil from 3,755-56 ft. in April 1939, but failed to produce.

Two New Pools in Coleman County

Huffman-Holland Co. of Fort Worth had a 150-bbl. well at 1 Dr. R. Bailey, 3 miles southeast of Echo, Section 17, H.T.&B. Survey, in Coleman County, to open a new producing spot. Production was from the Bend series at 2,713-93 ft. and was estimated at 150 bbl. a day after acid treatment.

The well is the first discovery to be drilled in eastern Coleman County in 2 years. It is 1 mile northeast of Camp Colorado and is 3,000 ft. north of two old producers brought in by Texas Pacific Coal & Oil Co. in 1922 from the Ranger lime at 2,735 ft. These two wells produced oil until 1934.

Another new spot was at Anzac Oil Corp. 1-T Morris, 6,160 ft. north and 3,520 ft. west of the NE cor. of the H.T.&B. Survey 75, but in the southeast part of the L. H. McNeil Survey 234. Total depth was 2,145 ft. and the well was making from 10 to 20 bbl. a day, natural.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Comanche County: F. O. Akin 1 Pink Scott, Sec. 21, Blk. 2, H.&T.C. Sur., dry, T.D. 2,800 ft.

Jones County: H. W. Lee et al 1 A. D. Roberts, Sec. 2, Blk. 16, T.&P. Sur., dry, T.D. 2,623 ft.

Fields

Cook, Shackelford County: Roeser & Pendleton and Continental 11-A W. I. Cook estate, Sec. 117, E.T. R.R. Sur., pumped 90 bbl. oil and 10 bbl. water, sand 1,693-1,700 ft., T.D. 1,702 ft.

Jim Ned, Coleman County: M. J. Delaney 1 E. S. Green, Lot 1, Hiram Kegans Sur. 520, flowed 106 bbl. through ¼-in. tubing choke in 18 hr., natural, est. 125 bbl. potential, sand 3,913-43 ft., T.D. 3,944 ft.

Lewis Production 1 Linnie Babston, Lot 1, Hiram Kegans Sur. 520, flowed 32 bbl. oil in 21 hr. through ¾-in. tubing choke, shot 3,903-24 ft., T.D. 3,926 ft.

Novice, Coleman County: States Oil 1 Frank Hudson, Sec. 22, Blk. 2, T.&N.O. Sur., old well, T.D. 3,540 ft., flowed 232 bbl. in 6 hr. through ¾-in. tubing choke, est. 650 bbl. potential.

Miscellaneous

Brown County: Burton McCullum, agent, 2 C. M. Carter, 330 ft. from N and W lines of Lot 6, Charles Messer Sur. 127, pumped 4 bbl. oil plus 30 per cent water after acid, lime 901-19 ft., T.D. 950 ft.

Burton McCullum, agent, 1 P. B. Page, 330 ft. from N and W lines of Lot 5, Charles Messer Sur. 127, gaged 140,000 cu. ft. gas, shot 931-37 ft., T.D. 955 ft.

Burton McCullum, agent, 10 J. V. Sewalt-B, 330 ft. from N and E lines of P. M. Whittington Sur., pumped 2 bbl. oil plus 67 per cent water after acid, lime 938-44 ft., T.D. 952 ft.

Burton McCullum, agent, 20 J. V. Sewalt-B, 1,650 ft. from N and E lines of P. M. Whittington Sur., pumped 3 bbl. oil plus 88 per cent water after acid, lime 875-934 ft., T.D. 934 ft.

Stephens County: J. R. Tolbert 1 S. L. Moon, Sec. 5, Blk. 3, S.P.R.R. Sur., 3,020,000 cu. ft. gas, sand 4,008-20 ft., T.D. 4,033 ft.

Jack County Discovery Develops Water Trouble

Trouble had developed at north Jack County's apparent discovery of an Ordovician field, Taubert & McKee 1 Boyd, Hazel Survey, 3 miles south of Post Oak when the well was opened to flow. It made 25 bbl. of oil and 38 bbl. of salt water in 3 hours through ½-in. choke. The water was the first reported as the well had made pipeline oil on first completion from 6,435 ft. It was understood operators plan to squeeze off the bottom for a shutoff.

Grayson County Possibilities

Efforts were still being made to get a producer at R. T. Tolbert and Denver Producing & Refining Corp. 1 R. H. Jewell, Block 15, William Allen Survey, northwest of Sadler in northwestern Grayson County. Operators got a little oil show in swabbing down to 7,000 ft. through casing set at 7,155 ft.

It was acidized with 1,000 gal. and 20-bbl. oil load in a section from 7,178-7,209 ft. in a section previously classified as basal Strawn of the Pennsylvanian. Swab tests were being taken at week's end.

Montague Test Quits

Plugging orders were due for Continental 1 J. F. Yowell, Section 8, Limestone Survey, Montague County wildcat northeast of Stoneburg. On a 50-minute drill-stem test at 7,156-7,224 ft., the well returned 7,000 ft. of salt water. Some tops: Viola, 6,386 ft.; Simpson, 7,135 ft. Although no data were released by the company, it was considered the Simpson top actually was top of the Ellenburger.

NORTH TEXAS COMPLETIONS

Wildcats

Archer County: Waldo E. Stephens, trustee, 2 H. B. Adae, 1,650 ft. from S and W lines of Sec. 8, P.P. C.S.L. Sur., A-339, 1½ mi. N of Dundee, dry, T.D. 1,705 ft.

Wichita County: C. F. Schram et al 1 E. P. Thompson, 700 ft. from N and W lines of L. Lopoelon Sur., A-173, 5 mi. SE of Wichita Falls, dry, T.D. 670 ft.

Fields

Bowers, Montague County: Pace Petroleum 1 W. C. Fisher estate, 2,550 ft. from S line and 330 ft. from W line of J. Reese Sur., A-629, dry, T.D. 3,982 ft.

Halsell, Clay County: Bridwell 8 Furd Halsell-A, 1,400 ft. S and 467 ft. W of NE cor. of J. Rogers Sur., A-390, pumped 17 bbl., conglomerate 3,656-63 ft., T.D. 3,908 ft.

K.M.A.-Ellenburger, Wichita County: E. C. Oil 5-E Anna Mangold-A, 467 ft. from W line and 660 ft. from N line of Lot 35, Mangold subd., P. Castleman Sur., A-35, potential 1,528 bbl., dolomite 4,309-84 ft., acid, T.D. 4,384 ft.

Lewis Production and Selby Oil & Gas 10-E Anna

(Continued on Page 120)

EASTERN TEXAS

Offset to Concord Discovery Reported Running High

By ROBERT INGRAM

DALLAS, Tex.—A high marker was reported on the Pecan Gap chalk at Magnolia Petroleum Co. 1 Kelley, Jesse B. McNealy Survey, south offset to the discovery well in the Concord low-gravity Woodbine sand pool of northeastern Anderson County. The Pecan Gap was topped at 3,510 ft. (tentative) which would be about 15 ft. high to the discovery. Base of the formation was established on the basis of cuttings, at between 3,611 ft. and 3,641 ft. The well continued drilling and was below 3,672 ft.

The Concord area is the latest East Texas discovery. An earlier strike, in the Kildare area, was also holding some attention as A. R. Swann of Tulsa was reported to have leased a block of about 5,000 acres in southern Cass County in the James Wanhope, Joseph Watkins, and John M. Watson surveys, just northwest of the new pool. At the same time C. C. Gilger 1 Grogan Co., Watson Survey, north and slightly west offset to the Kildare discovery, was drilling below 4,500 ft. in the second hole after junking the first one near the top of the pay section.

First M-68 Location Made at Joaquin

A new operation for the Joaquin Rodessa-Glen Rose gas-distillate area was announced last week by Southern Production Co. The firm will drill 1 Stephens, 662 ft. south and 700 ft. west of the center of a northeast 100.86-acre tract in the Thomas Bristow Survey, Shelby County, on a unit in which the company was joined by Pure Oil Co.

This is the first location for the gas-distillate area under Order M-68 which requires that gas-well locations be made on 640-acre spacing. The area is cut up into many small tracts, so it was necessary to unitize the area before any development could be undertaken. The Southern company, which is the producing subsidiary of the Southern Natural Gas Co. of Birmingham, Ala., holds considerable scattered acreage in Shelby County and across the line into Caddo Parish in North Louisiana.

EAST TEXAS COMPLETIONS

Fields

Chapel Hill, Smith County: Delta Drilling 1 Jim Walton, Stillwell Box Sur., flowed 202 bbl. through ¼-in. choke, packer at 7,928 ft., T.D. 8,275 ft.

Hawkins, Wood County: W. W. Bradley 1 J. A. Snider, J. P. Moseley and S. Castleberry Sur., 84.6 bbl. in 6 hr. through ¼-in. choke, perf. 4,765-85 ft., T.D. 4,912 ft.

Humble 7-B L. A. Bryan, M. A. Esparcia Sur., 89.27 bbl. in 6 hr., through ¼-in. choke, Austin chalk 4,247 ft., Woodbine 4,666 ft., T.D. 4,903 ft.

Humble 2-B J. T. Green, H. E. Watson Sur., 110.79 bbl. in 6 hr. through ¼-in. choke, Austin chalk 3,747 ft., Woodbine 4,056 ft., Georgetown lime 4,548 ft., T.D. 4,601 ft.

Humble 3 T. C. Snow, W. Herrington Sur., 110.84 bbl. in 6 hr. through ¼-in. choke, Austin chalk 4,092 ft., Woodbine 4,482 ft., T.D. 4,870 ft.

Pleasant Grove, Rusk County: H. H. Groneman 1 Diblin Grocery Co., J. I. Sanches Sur., dry, T.D. 3,010 ft.

L. O. McCillian 1 D. K. Heath, J. I. Sanches Sur., dry, T.D. 2,935 ft.

Powell, Navarro County: Guy Sitton 5 L. A. Pugh, heirs of J. Smith Sur., dry, T.D. 1,555 ft.

APPALACHIAN FIELDS

Deep Oriskany Tests Show Little Encouragement

PITTSBURGH, Pa.—In West Virginia, the deep rotary test in Lewis County proved a failure. In Tyler County, a deep test is nearing the Corniferous lime. In Pennsylvania, there were several fair gas wells.

SOUTHWEST PENNSYLVANIA

On Chestnut Ridge in South Union Township, Fayette County, New Penn Development Co., William E. Snee et al are drilling at 7,847 ft. in 1 Kirby, or 85 ft. below the top of the Oriskany sand which so far has been void. There is still about 125,000 cu. ft. of gas from the Onondaga chert.

On the Fayette anticline in South Huntington Township, Fayette County, Peoples Natural Gas Co. is drilling at 7,821 ft. in the test on the Jacobs Creek Oil Co. and still in chert. The Onondaga section is now 504 ft. thick with no signs of any Oriskany sand.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Bethel Township: Apollo Gas Co. 1 Findley Mansfield, 133,000 cu. ft. gas, Tiona sand 3,025-40 ft., gas 3,027 ft., T.D. 3,062 ft.

Fayette County, German Township: Duquesne Gas Co. 1 Ross heirs, 338,000 cu. ft. gas, Fifth sand 2,296-2,390 ft., gas 2,296 ft., 2,318 ft., and 2,335 ft., Elizabeth sand 2,438-58 ft., gas 2,448 ft., T.D. 2,600 ft.

Nicholson Township: Blaho & Tedrow 1 Wheyl Coke Co., 30,000 cu. ft. gas, stray sand at 1,891 ft., T.D. 2,044 ft.

Greene County, Center Township: Manufacturers Light & Heat Co. 1 S. B. Eagan, 452,000 cu. ft. gas, Fifty-foot sand 3,055-3,103 ft., gas 3,070-74 ft., gas 3,088-90 ft., Gordon sand 3,175-3,230 ft., gas 3,202 ft., T.D. 3,318 ft.

Cumberland Township: Equitable Gas Co. 1 Nellie B. Gideon, drilled deeper, dry, T.D. 2,968 ft.

Jackson Township: Manufacturers Light & Heat Co. 3 Mary E. Smith, 600,000 cu. ft. gas, Nineveh Thirty-foot sand 2,931-55 ft., gas 2,933 ft., Fifth sand 3,165-85 ft., gas 3,175 ft., T.D. 3,378 ft.

Monongahela Township: E. C. Metzler et al 1 John Barb heirs, 450,000 cu. ft. gas, Big Injun 1,435 ft., gas 1,565-75 ft., T.D. 1,585 ft.

Donley & Lough 1 Mrs. Eli Boone, drilled deeper, start 1,483 ft., 900,000 cu. ft. gas, Big Injun 1,432 ft., gas 1,562-67 ft., T.D. 1,572 ft.

Washington County, Somerset Township: A. C. Phillips & Co. 1 J. C. Huffman, 112,000 cu. ft. gas, gas sand 1,084-95 ft., coal 1,095-1,100 ft., sand 1,185-1,208 ft., oil 1,190 ft., Salt sand 1,218 ft., gas 1,248-70 ft., hole filled up 250 ft. oil in 12 hr., gas initial gage 600,000 cu. ft., T.D. 1,275 ft.

Westmoreland County, Bell Township: Kiski Valley Gas Co. 1 S. M. Kier, 561,000 cu. ft. gas, Speechley sand 2,706-57 ft., gas 2,745 ft., T.D. 3,452 ft.

WEST VIRGINIA

In Lewis County, the deep rotary test of the Hope Natural Gas Co. on the J. D. Lovett farm in Freemans Creek district, is cosndered a dry hole. With a starting elevation of 1,131 ft. it topped the Corniferous lime at 6,638 ft., Oriskany 6,898 ft., and was bottomed at 6,995 ft. For test, casing was run to the Corniferous and the Oriskany tested which gaged only 28,000 cu. ft., or uncommercial for that depth. This is the second test on the structure and it was 49 ft. lower on structure than 1 Alfred Woofter.

WEST VIRGINIA COMPLETIONS

Boone County, Scott district: Owens, Libby-Owens 632 Cassingham Coal & Land Co., 140,000 cu. ft. gas, Big lime 1,207-1,434 ft., Injun 1,434-95 ft., Berea 1,916-36 ft., T.D. 1,967 ft.

Lincoln County, Duval district: South Penn Natural Gas Co. 4 Holley Stephenson et al, 3 bbl. in Berea, Big lime 1,819-1,997 ft., Injun 1,997-2,050 ft., Berea 2,509-31 ft., T.D. 2,532 ft.

Putnam County, Curry district: Charles Gas Co. 2 Oscar Johnson, 169,000 cu. ft. gas after shot, Big lime 1,638-1,803 ft., Big Injun 1,835-75 ft., Berea 2,339-63 ft., T.D. 2,383 ft.

Teays Valley district: Owens, Libby-Owens 624 Wilson Coal Land Co., dry, Big lime 1,740-1,929 ft., Injun 1,929-84 ft., Berea 2,489-2,520 ft., show gas 6,000 cu. ft. at 2,490 ft., T.D. 2,568 ft.

Ritchie County, Grant district: Hartman & Richards 3 fee, dry through Injun and Squaw sand, T.D. 1,901 ft.

Wayne County, Union district: Owens, Libby-Owens 633 Armilda Gilkerson, 1,240,000 cu. ft. gas, Big lime 1,146-1,303 ft., Injun 1,303-1,400 ft., Berea 1,930-55 ft., brown shale 2,459-2,939 ft., R.P. 363 lb., T.D. 2,938 ft.

Wetzel County, Grant district: Hope 10 Mike Barr, dry, Big Injun 2,217-2,407 ft., show oil 2,317-29 ft., shot, T.D. 2,417 ft.

Wood County, Union district: C. B. Smith 1 Lena Mellinger, 1½ bbl., Maxton sand, Cow Run sand 1,143-88 ft., Maxton 1,568-1,626 ft., T.D. 1,630 ft.

ORISKANY GAS FIELDS

Jackson County, Ravenswood district: Hope 8600 F. L. Hutchinson, 4,213,000 cu. ft. gas, Big lime 1,827-1,936 ft., Injun 1,936-85 ft., Berea 2,400-19 ft., Corniferous 4,964-5,085 ft., Oriskany 5,085 ft., not shot, R.P. 1,325 lb., T.D. 5,103 ft.

Ripley district: United Carbon Co. 931 Godfrey L. Cabot, 9,622,000 cu. ft. gas, Maxton 1,795-1,900 ft., Big lime 1,930-2,050 ft., Injun 2,100-20 ft., Corniferous 5,030-5,141 ft., Oriskany 5,141 ft., shot 5,142-66 ft., T.D. 5,187 ft.

United Carbon Co. 974 L. B. Parsons, 10,500,000 cu. ft. gas, Salt sand 1,350-1,500 ft., Maxton 1,760-1,908 ft., Big lime 1,908-73 ft., Injun 1,973-2,000 ft., Berea 2,460-72 ft., Oriskany 5,101 ft., T.D. 5,105 ft.

Kanawha County, Poca district: Godfrey L. Cabot, Inc., 7 Poca Coal Land Co., 1,220,000 cu. ft. gas, Corniferous 4,926 ft., Oriskany 5,014 ft., R.P. 1,550 lb., T.D. 5,035 ft.

North Central Texas Fields

(Continued from Page 119)

Mangold, 467 ft. from W line and 660 ft. from S line, Lot 36, Mangold subd., P. Castleman Sur., A-35, potential 872 bbl. natural, dolomite 4,282 ft., T.D. 4,343 ft.

Nocona, Montague County: Sinclair Prairie 2 Lena Benton, 330 ft. from N line and 1,263 ft. from W line of Lena Benton tract in T. R. Jackson Sur., A-349, flowed 985 bbl., pay in lime 4,535-47 ft., acid, T.D. 5,210 ft.

Thornberry, Clay County: C. Y. Gorman 1 C. T. Taylor estate-C, 330 ft. from SW and SE lines of N 40 acres in E½ Lot 38, Bacon subd., dry, T.D. 1,150 ft.

Miscellaneous

Montague County: Continental 1-S J. F. Yowell-A, 330 ft. from N and E lines of SW NE Sec. 8, L.S.C. S.L. Sur., A-421, dry, T.D. 1,239 ft.

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CALIFORNIA FIELD REPORT

New Field Opened Southwest Of North Belridge

By L. P. STOCKMAN

LOS ANGELES, Calif.—Shell Oil Co., Inc., appears to have discovered a new oil field 5 miles west of the southern tip of the North Belridge field of Kern County in the San Joaquin Valley as a formation test on 45-6 Williams in 6-28s-20e resulted in a flow for several hours at a daily rate of 1,728 bbl. of relatively clean 16.4-gravity oil. This wildcat, one of several drilled by Shell in this immediate area is at present standing cemented with the water string landed on top of the pay at 2,280 ft. Shell spudded this wildcat on April 18 and a short time later found a dry-gas zone above the present oil sand. On a formation test early in the week at 1,769-1,829 ft. the well blew dry gas at a daily rate of 1,300,000 cu. ft. through a 48/64-in. bean. Bottom-hole pressure was found to be 375 lb. and when the bean was reduced to 22/64-in. the well flowed at a daily rate of 605,000 cu. ft. A second gas zone, which was given a formation test at 1,829-1,970 ft., was good for a good blow at a daily rate estimated to be around 5,000,000 cu. tf. While these two formation tests were under way the bottom of the hole was 2,111 ft. and the shut-in pressure following completion of the tests was 900 lb. indicating the well had considerable kick. Shell resumed drilling again, although failure to find a shallow oil zone was distinctly disappointing, and at 2,280 ft. encountered a well-saturated oil sand. Drilling operations continued to 2,340 ft. and when the bit was still in the probable pay at that point the company decided to set casing preparatory to a production test in the conventional manner as the above-mentioned formation test of the oil-sand member indicated the existence of a probable commercial accumulation.

The oil is a normal heavy-gravity crude that is at present in high demand as a result of increased demand for fuel oil. The comparatively shallow depth at which the pay was found is another favorable factor and if it becomes necessary a number of these wells could be drilled within a short time as actual drilling time from spud to completion would only require about 3 weeks. Prevailing geological and structural conditions remain to be determined and while the new oil zone is generally believed to be the Temblor it is not at all improbable that it may be the Santa Margarita of upper Miocene age. Production characteristics, gravity of oil, and relatively shallow depth to the pay are quite similar to conditions prevailing in the Mount Poso, Round Mountain, and other similar fault traps in the eastern rim of the San Joaquin Valley where production is derived from the Vedder of Miocene age. The present scene of operations west of the southern tip of the North Belridge field is on the west side of the valley in the northwestern part of Kern County and about 50 miles northwest of Bakersfield, the county seat, and approximately 35 miles northwest of the town of Taft in the center of the Midway-Sunset field. Topography is relatively favorable, consisting of a gentle rolling plain marked here and there with slightly higher elevations. The Temblor is found in the North Belridge field around 5,000 ft. and if the new oil sand found by Shell proves to be Temblor it will indicate a very decided rising trend to the west as there is 2,600 ft. difference in vertical depth in a distance of slightly less than 5 miles, or in excess of 500 ft. to the mile.

Every indication points to the probability that Shell will successfully complete 45-6 Williams as an excellent well and since 60 ft. of oil sand has already been cored the area should have a long life. The productive area of the new field has been quite definitely defined to the east and south by dry holes. In Section 5, almost due east of the discovery well, Shell drilled 3-1 Voight to a depth of 4,854 ft. and abandoned the hole without finding commercial production in 1936 and in 31-27s-20e Shell drilled a dry hole, 4-1 Voight, to a depth of 4,100 ft. and likewise abandoned the hole. South of Section 6, in Section 7, Continental Oil Co. drilled a dry hole in the south central part of the section to a depth of 5,304 ft. The area to the west and northwest is wide open and the production trend will probably be in that direction. It is interesting to note that the new area is northwest of South Belridge and that if the axis of that structure was extended it would pass approximately through Shell's new district. It will be interesting to watch development of this new field inasmuch as the dry-gas zone above might be used to flow the oil if the oil sand does not contain enough gas to result in a sustained flow. Acreage around Shell's new wildcat is all held in relatively large blocks and for this reason the

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number of operators may be rather limited and possibly restricted to Shell, Continental, Chanslor-Canfield Midway Oil Co., and a few others.

Raisin City Well Makes Big Flow

Shell also has a likely looking well at Raisin City in 33-19 Santa Ana & Fresno Land Co., which was gaged during a 3-hour formation test at a daily rate of 4,128 bbl. of clean 26-gravity oil from 5,245 ft. If it comes up to expectations it will prove to be the first really large flowing well to be finished in the Raisin City field since its discovery. There have been two or three wells in this field that have showed initials of 1,000 to 1,500 bbl. per day for a short time but nothing around 3,000 to 4,000 bbl. initially. The showing of this well is of primary importance because it is located in one of the few locations available in accordance with the provisions of M-68 with respect to the 40-acre spacing and also because the well is located down structure in the southern part of the field. Casing has been cemented and this outpost at Raisin City along with the new Williams wildcat near Belridge should be ready for production tests late next week. The showing of 33-19 Santa Ana & Fresno Land of Shell may prove the tip-off on what to expect in future development of Raisin City as this well tends to indicate that the oil sand is thicker down on the structure and tight and thinner on the apex of the anticline.

SAN JOAQUIN VALLEY COMPLETIONS

Jasmine wildcat district, Kern County: Termo Co. 1 Salca, 1-25s-27e, dry, T.D. 1,828 ft., grit zone 1,695-99 ft., Rhyolite ash 1,699-1,828 ft., no Vedder zone of Miocene age present.

Kettleman North Dome, Fresno County: Kenda 321-30-J, 30-21s-17e, flowed 126 bbl., 41.8-gravity, 3 per cent cut, 5,000,000 cu. ft. gas, 40/64-in. bean, pressures 2,400/2,450 lb., T.D. 10,960 ft., perf. 10,840-10,956 ft., brown shale 6,482 ft., Temblor of Miocene age 7,587 ft., McAdams sand of Eocene age 10,530 ft., completed in McAdams sand.

Standard Oil Co. 343-3-P fee, 3-22s-17e, flowed 255 bbl., 49.9-gravity, 5 per cent cut, 13,575,000 cu. ft. gas, 40/64-in. bean, pressures 2,250/2,400 lb., T.D. 10,175 ft., perf. 9,890-10,174 ft., completed in McAdams sand of Eocene age.

Marysville Buttes gas field, Sutter County: Buttes Oilfields, Ltd., 7 Buttes, 3-15n-1e, flowed 1,650,000 cu. ft. gas, 16/64-in. bean, flow pressure 1,850 lb., T.D. 5,245 ft., perf. 4,920-60 ft., 4,980-84 ft., 4,995-5,005 ft., 5,120-44 ft., 5,210-20 ft., 5,221-42 ft., completed in Buttes gas sand of Cretaceous age, potential of well exceeds recorded initial flow.

Midway-Sunset, Kern County: General Petroleum Corp. 232-35 Moco, 35-12n-24e, pumped 20 bbl., 13.7-gravity, T.D. 990 ft., perf. 689-989 ft., completed in shallow zone of Pliocene age.

Standard Oil Co. 103-27-B fee, 27-31s-23e, pumped 45 bbl., 21.5-gravity, 2 per cent cut, T.D. 2,970 ft., perf. 2,435-2,513 ft., 2,554-2,708 ft., 2,876-2,968 ft., Wilhelm sand 2,427 ft., so-called gusher sand of Pliocene age 2,548 ft.

Union Oil Co. 25-14-B, 14-32s-23e, pumped 25 bbl., 16.1-gravity, 55 per cent cut, T.D. 3,035 ft., P.B. 2,641 ft., perf. 2,286-2,640 ft., completed in so-called gusher sand of Pliocene age.

Riverdale wildcat district, Fresno County: General Petroleum Corp. 45-21 Community, 21-17s-19e, dry, T.D. 8,267 ft., bottomed in Eocene.

Buena Park Development Under Way

Texas Co., which discovered production in the Buena Park district of Orange County a few months ago, has started a second well designated as 1 Buena Park Unit 1 and will soon have a third well under way as 4-E-1 Buena Park. The former is located in 6-4s-10w and the latter will be drilled in 36-3s-11w. Neither will reach the pay for another 60 days as this new field requires the drilling of a well to almost 9,000 ft. The discovery well in this field was 1 Spencer which was brought in flowing 90 bbl. of clean 21.1-gravity oil from an unknown interval. It is not definitely known where current production is coming from as the perforations at 8,900-32 ft. were squeezed with cement and subsequently the well began to flow. Production may be coming from a few perforations that were not entirely sealed off with cement and then again the 15 sacks of cement used might have channeled out into the formation and left only the upper or lower section of perforations open. The next completion at

Buena Park should determine the importance of this oil sand from a production standpoint and also show which way the field will extend. The structure at Buena Park is a plunging nose which under ordinary conditions would show a much greater thickness of oil sand at a high point structurally but which in this case may show the greatest thickness of oil sand low down on the structure as the nose is plunging toward the center of great thickness in the central valley and away from the area where the various formations thin out.

Reconditioning Aids Santa Fe Springs Production

Bandini Petroleum Co., a subsidiary of Wilshire Oil Co., prominent independent producer, refiner, and marketer in California, got a pleasant surprise early this week when its 20 Off, after some remedial work, was returned to production flowing 1,200 bbl. of 32.9-gravity oil and 1,000,000 cu. ft. of gas per day from the Meyer zone in the Santa Fe Springs field. This production was through open line and while the cut was about 10 per cent the large flow proved quite welcome. Bandini Petroleum has done this several times in the past and has almost always succeeded in greatly stimulating production. This well had dropped down to about 20 bbl. per day before reconditioning work was undertaken and so the net increase paid for the cost of the work in the first few days of production. The Off lease has produced considerable oil over a period of years and has proved a splendid property especially if further reconditioning work can change some of the other small wells into larger producers. Practically all work in the Santa Fe Springs field in recent years has consisted of reconditioning or rejuvenating work ranging all the way from cleanout jobs to reperforating jobs in other sands.

LOS ANGELES BASIN COMPLETIONS

Huntington Beach, Orange County: Southwest Development Co. 46 State, 4-6s-11w, pumped 435 bbl., 24.2-gravity, 0.3 per cent cut, T.D. 5,594 ft., perf. 4,762-5,584 ft., completed in Huntington tideland by directional drilling which placed bottom of the hole beneath Pacific Ocean in rocks of Miocene age.

Santa Fe Springs, Los Angeles County: Hathaway Co. 118 Jalk, 6-3s-11w, pumped 48 bbl., 34.1-gravity, 1.6 per cent cut, T.D. 4,570 ft., perf. 4,350-4,570 ft., completed in Bell zone of Pliocene age.

Wilmington, Los Angeles County: Allied Petroleum Corp. 26 Harbor, 32-4s-13w, pumped 140 bbl., 14.1-gravity, 5 per cent cut, T.D. 3,626 ft., perf. 2,689-2,850 ft., 2,974-3,161 ft., 3,371-3,490 ft., 3,573-3,620 ft., set whipstock at 2,690 ft. and redrilled to re-

(Continued on Next Page)

Permian Basin, Panhandle

(Continued from Page 109)

ing choke after acid, pay 4,451 ft., T.D. 4,685 ft.

Todd Deep, Crockett County: Amerada 2-A Todd, 1,980 ft. from S and E lines Sec. 25, Blk. WX, G.C.& S.F. Sur., elev. 2,529 ft., *½-mile north outpost*, flowed 386 bbl. in 6 hr. through 1-in. tubing choke, crinoidal 5,655 ft., top porosity 5,670 ft., pay 5,682 ft., T.D. 5,986 ft. in Simpson, P.B. 5,937 ft.

Walker, Pecos County: William Wolf 1-A University, 990 ft. from S line and 330 ft. from E line Sec. 26, Blk. 16, University Sur., junked, T.D. 554 ft.

TEXAS PANHANDLE COMPLETIONS

Gray County: Magnolia 50 fee-227, Sec. 15, Blk. 3, I.& G.N. Sur., potential 191 bbl., pay 2,910 ft., T.D. 3,011 ft.

Phillips 5 Pan-Baer-A, Sec. 126, Blk. 3, I.&G.N. Sur., potential 156 bbl., pay 3,242-77 ft., T.D. 3,283 ft.

Hutchinson County: Gulf 111 Dials, Sec. 1, Blk. 1, H.& G.N. Sur., potential 173 bbl. oil and 18 bbl. water, pay 3,010-30 ft., T.D. 3,045 ft.

Phillips 64 J. A. Whittenburg, Sec. 63, Blk. 46, H.& T.C. Sur., potential 117 bbl., pay 2,679-2,756 ft., T.D. 2,761 ft.

Wheeler County: Smith Brothers 2 Harlan-B, Sec. 49, Blk. 24, H.&G.N. Sur., temporarily abandoned.

Smith Brothers 12 D. E. Johnson, Sec. 34, Blk. 24, H.&G.N. Sur., temporarily abandoned at T.D. 2,470 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Wildcat, Lea County: L. E. Elliott 1 Parcell, NW SE 8-21-38, dry, T.D. 4,401 ft. in lime.

Lynn, Lea County: Continental 1-B Stevens, SW SW 15-23-36, dry, T.D. 3,850 ft., shot 3,640-92 ft.

Square Lake, Lea County: Culbertson & Irwin 1 Bowman, NW NW 28-19-32, pumped 196 bbl. in 22 hr., pay 2,750 ft., T.D. 2,811 ft., acidized.

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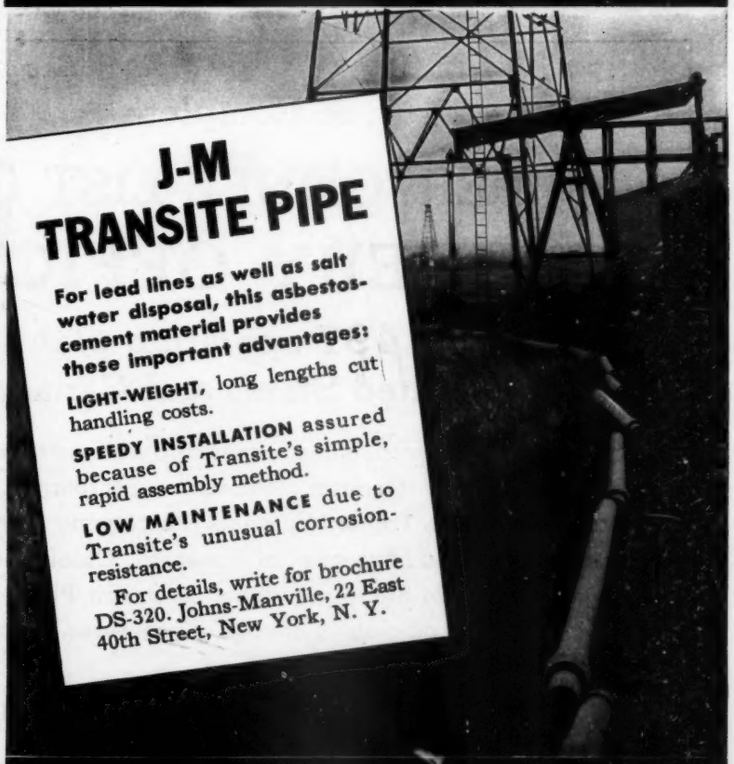

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NO. LOUISIANA, ARKANSAS

Location Staked Northwest Of Midway Field

SHREVEPORT, La.—The Midway field is being extended steadily to the southeast and is broadening in that direction so that still further extension is to be expected. The elevation of the top of porosity in the discovery well was —6,032 ft. and the north and south offsets were 110 and 146 ft. lower, respectively. Barnsdall 2 Roberts, SE SW 11-15s-24w, found the top of porosity at —6,048 ft. and its north and south offsets are 95 and 42 ft. lower, respectively. Latest to report the top of porosity was Barnsdall 3 Roberts, NW NE 14-15-24, south offset to No. 2, which found porosity at 6,353 ft. and set 5½-in. casing at 6,467 ft. Elevation is 268 ft.

Reference to the map published in the Journal (Jan. 15, 1942, p. 82) will show that development to date has been in the southeast corner of the Barnsdall block, leaving a large untested area to the north and west. There has been some speculation as to the nature of this acreage and whether it was not condemned by the limiting of production north, west and southwest of the discovery well. The possibility of a second parallel structure is suggested by location of a new test, Barnsdall 1 Gunther-Spencer, SE SW 5-14-24, 3 miles west-northwest of the original discovery.

ARKANSAS COMPLETIONS

Mount Holly, Union County: Atlantic 1 Johnson, SW NE 15-17-18, 100 bbl., pay 7,195 ft., T.D. 7,207 ft.

NORTH LOUISIANA COMPLETIONS

Caddo Parish: A. Paul Gilbert 1 Thigpen-Herold, 35-22-16, pumped 30 bbl., T.D. 2,465 ft.

J. E. Marshall A-5 Spell, 29-21-15, pumped 25 bbl., T.D. 1,588 ft.

Transport Oil Co. 2 Wilkinson, 22-20-14, dry, T.D. 976 ft.

Claiborne Parish: Ohio Oil Co. 21 Sherman-2, 15-23-8, flowed 200 bbl. in 5 hr. through choke, pay 5,234-5,296 ft., acidized.

California Fields

(Continued from Preceding Page)

completion depth in Ranger zone of Pliocene-Miocene age.

Newhall Potrero Outpost Staked

Texas Co. is preparing to start an outpost in the northwestern end of the Newhall Potrero field of Los Angeles County in the coastal district and derrick should be finished within another few days. Initial well of Texas Co. will be in 22-4n-17w and if this company succeeds in extending the Newhall Potrero field it will prove up some additional locations for Barnsdall Oil Co. which concern discovered the Newhall Potrero field with its 1 Rancho San Francisco several years ago. Barnsdall 31 Rancho San Francisco, which is being drilled south of the original proved limits of the field and a little less than 1 mile northwest of 1 Ferguson of C. G. Willis et al, has been held up for the past week with mechanical trouble resulting from a twistoff that left 21 stands of drill pipe in the hole. Some progress has been made and it is quite possible that the bit will again begin making hole shortly. This well is bottomed at 7,105 ft. and since top of the third Modelo zone was cored at 6,894 ft. it is expected to show production when finished.

COASTAL COMPLETIONS

Aliso Canyon wildcat district, Los Angeles County: Shell Oil Co. 2-1 Mission, 25-3n-16w, dry, T.D. 6,978 ft., plugged to 2,141 ft. and tested interval 1,220-2,141 ft., bailed mud, water, and trace of oil.

Riru, Ventura County: Pacific Western Oil Co. 11 Temescal, 4-4n-18w, pumped 250 bbl., 18.6-gravity, 7 per cent cut, T.D. 3,267 ft., perf. 2,779-2,982 ft., 3,177-3,262 ft., completed in B. & L. zone of Miocene age.

Santa Maria Valley, Santa Barbara County: Union Oil Co. 2-3 Bradley lands, 36-10n-34w, pumped 215 bbl., 15.6-gravity, 5 per cent cut, T.D. 5,456 ft., perf. 4,980-5,454 ft., completed in Santa Maria Valley zone of upper Miocene age.

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THE OIL AND GAS JOURNAL

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Illinois Basin Discovery Rate Shows Drop This Year

(Continued from Page 105)

discovered during the years 1940 and 1941.

The principal pools lie along a north northeast-south southwest trend paralleling the Wabash River and crossing into Indiana. The eastern portions of the Keensburg (Griffin) and New Harmony fields yield the greater port of the oil of that state. The fields are marked by multiple sand pays and tend to merge in one or more of these sands. Although initial production is not as large as in the McClosky, wells are long-lived and declines are relatively slow. The principal pays are of Pennsylvanian and upper Mississippian (Chester) age. The upper Chester sands are the most prolific producers and account for the majority of the output of this area. Pennsylvanian production has been found in several pools in the area and despite the fact that many of the wells report initial capacities of 300 or 400 bbl. the recovery from these sands is relatively unimportant. The lower Chester sands produce in most of the fields, the Aux Vases being one of the best producers in the area. No sands below the McClosky have been productive and there has been very little testing below that depth. It is unlikely that the deeper formations contain oil accumulations of commercial quantities in this area.

The sands in the Wabash River area are erratic in distribution, porosity and permeability. The discovery rate in this area is far greater than in the remainder of the state and extensive testing is under way at the present time. The area will probably remain one of the most active in the state for some time to come with emphasis on exploration of upper Chester sands.

La Salle Anticline Area

All of the fields in the La Salle anticline area were discovered between 1906 and 1912 with the exception of a few recently discovered small pools in the extreme southern part of the district near the Wabash River. These include Allendale (Bethel and McClosky), Patton, Ruark, South Lawrence and East St. Francisville, most of which are 1941 discoveries.

Pennsylvanian sands are the main producing horizons in the area and have produced about 50 per cent of all the oil that has been recovered. Lower Chester sands have been found productive in the recently opened pools but were of minor importance in the old fields. The Devonian and Trenton are relatively shallow in the northern part of the district and have produced from a few wells in the Casey district. Some upper Chester production has also been obtained and the McClosky formed the richest pay over a considerable area in the Bridgeport field.

The La Salle anticline fields were responsible for the first Illinois play and reached their peak production in 1907. There has been little activity in the sector since the start of the second play and as the whole area has been thoroughly prospected, little further activity may be expected. There will be additional discoveries but, like the recent ones, they will probably be small.

Outside of the six sectors discussed above, there are some small scattered fields and these suggest that the possibilities of the basin are not yet fully explored. The pays are the same as those found in the basin proper except that the Chester sands gradually pinch out on the north and west. Little encouragement can be held out for major discoveries beyond the edge of the Chester. Many believe that production will not extend much farther south than present development but it is quite possible that good production will be obtained south of the Shawneetown fault system which now limits the play.

North Turner Valley Outpost More Than 2,000 ft. Low

By VICTOR LAURISTON

CHATHAM, Ont.—Crude and natural gasoline production from all Alberta fields in March totaled 908,463 bbl. or 29,306 bbl. daily, a decrease of 464 bbl. daily from February but an increase of 2,395 bbl. daily over March 1941. The March total included 868,832 bbl. of limestone crude, 551 bbl. of shallow crude and 3,167 bbl. of naphtha from Turner Valley; together with 19,999 bbl. of natural gasoline from limestone gas wells and 9,749 bbl. from limestone oil wells. Production for the month from outside fields included Red Coulee, 899 bbl.; Vermilion, 5,109 bbl.; Wainwright, 1,299 bbl.; Dina-Ribstone, 800 bbl.; Taber, 932 bbl.; Tilley, 844 bbl.

Natural-gas production for March totaled 5,596,037,000 cu. ft. or 180,517,000 cu. ft. daily, a decrease of 17,686,000 cu. ft. daily from February and 16,263,000 cu. ft. daily from March 1941. The March production for various fields (in 1,000 cu. ft.) was: Turner Valley gas wells, 1,798,869; Turner Valley oil wells, 2,919,966; Viking, 81,639; Kinsella, 425,888; Medicine Hat, 281,125; Redcliff, 46,846; other fields, 41,704. Waste gas from Turner Valley was 2,334,379,000 cu. ft. in March compared with 2,314,484,000 cu. ft. in February.

May Quota Lower

The Petroleum and Natural Gas Conservation Board for Alberta has set the daily allowable for 184 Turner Valley crude producers for May at 26,260 bbl. compared with an April allowable of 26,787 bbl. daily.

To Abandon Deep Test

In the North Turner Valley extension, Ace Royalties 2, LSD 10, 22-22-4w5, was still in the lower Benton shale below 8,020 ft. and will probably be abandoned. The Dominion Government agreed to assist in deepening the test from 7,103 ft. in order to secure information on the general area. Before reaching the oil horizons in the lime the well would have to drill through the Blairmore, Kootenay and Fernie formations, and as the Blairmore is usually encountered above 6,000 ft., it is felt that the oil horizon could not be reached at a practical drilling depth. Ace 2 was located approximately 8 miles northwest of Atlas-British Dominion 2, the most northerly producer.

Easterly Test Gets Lime

In North Turner Valley, Major Oils 9, LSD 1, 4-21-3w5, got the lime at 7,635 ft., after faulting back to the Fernie shale. This is the most easterly drilling test in the North Turner Valley area and would indicate a possible new extension of the producing field in that direction.

TURNER VALLEY COMPLETIONS

North Turner Valley: Foothills Oil & Gas 11, LSD 11, 4-21-3w5, T.D. 7,422 ft., Madison at 6,878 ft., I.P. 945 bbl. daily with 2,335,000 cu. ft. of gas, 41.5-gravity crude.

West Central Section: Anglo-Canadian Oils 11, LSD 5, 25-19-3w5, T.D. 8,119 ft., Madison at 7,885 ft., I.P. 471 bbl. daily with 443,000 cu. ft. gas, 38.5-gravity crude.

Alberta Pacific Royalties 1, LSD 14, 6-19-2w5, T.D. 8,325 ft., Madison at 7,872 ft., I.P. 249 bbl. daily with 223,000 cu. ft. gas, 38.3-gravity crude.

Deepen Model Well

Model Oils 1, LSD 3, 22-20-3w5, finished in 1930 at 5,905 ft. as a naphtha well and which later turned to crude, is deepening to increase production. Originally finished about 105 ft. in the Madison lime, it reached a peak of around 190 bbl. and after 12 years steady production was making about 85 bbl. daily. Deepening to 6,215 ft. stepped this up to about 200 bbl., and it will be carried down to the dark lime to take production from both porous zones. A settled production between 200 and 250 bbl. daily is expected.

Tilley Field

In the Tilley field, eastern Alberta, Northwest Co. 2, LSD 4, 17-17-12w4, finished at 3,185 ft., is maintaining production around 60 bbl. daily, with less than 2 per cent water. A 3-in. pipe line has been laid to deliver crude to the loading rack on the C.P.R. at Tilley for shipment to the Imperial refinery at Regina. Northwest 4, LSD 5, 17-17-12w4, finished drilling at 3,182 ft. and is testing production. Northwest 3, LSD 13, 17-16-12w4, is below 1,929 ft. In the Eyremore district, 20 miles west, Standard of British Columbia 1, LSD 4, 24-18-17w4, is below 2,378 ft.

Taber Operations

In the Taber field, southern Alberta, Standard of British Columbia 1 has been spotted in LSD 9, 18-9-16w4, about 3½ miles west of Taber. The company holds extensive acreage, and has been carrying on careful survey work for about 2 years. Can-Tex Drilling Co. has the contract and rotary equipment is being moved from the Steveville field. Test will likely spud this month.

Vermilion Field

The Vermilion shallow field, eastern Alberta, now shows 10 wells either on steady production or ready to start pumping. Vermilion Consolidated 2, the discovery well, has been in steady production for approximately 2 years. Flobell 1, LSD 12, 29-50-5w4, finished at 1,819 ft., drilled out cement when crude rose 800 ft. in the hole, indicating a better than average producer. Pumping equipment is being installed. Vermilion

(Continued on Page 131)

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Among the Drilling

Contractors Expect Rate Of Drilling to Stabilize

THE EFFECT of recent government restrictions on drilling was stabilized to a certain extent recently when it became evident that probably the maximum reduction in work had been reached. Most contractors report that work is at about 30 per cent of the level it was late last year.

One of the complicating factors is the necessity of clearing a great many matters with government agencies before work can proceed. Fear that OPC has delegated some well other than the first one completed special exception after the M-68 ruling effective date has caused operators to be extra cautious. Several drilling firms are awaiting the final word from the Government before proceeding on modestly comprehensive programs.

A rumored tightening of the casing situation is anticipated and both operators and drilling contractors are examining their pipe supplies. So far no word has come out that further curtailments are to be expected but it is feared that it will be increasingly difficult to find pipe for field wells.

A sidelight of the steel situation was given by one supply company when it issued orders that no wire lines were to be sold except on A-1-C priority ratings, or higher. This indicates that the particular company has all the orders for materials it can supply bearing ratings of A-1-C or higher and that it will be impossible to make deliveries for other than wildcat drilling.

●

W. J. and JOHN MORAN Drilling Co., Wichita Falls, Tex., has been awarded the contract for a 6,500-ft. test being drilled by Walter K. Jones and Roy Dale Jones, of Oklahoma City, Okla. Derrick has been completed at the 1 Gus Darnell, in C NW NW of Section 173 of T.&P. Survey, 2 miles northeast of Peaster and 12 miles north of Weatherford, Parker County, Texas. Continental Oil Co. is supporting the test.

NOBLE Drilling Co., Ardmore, Okla., has the contract for Carter Oil Co. 2-D State, in SW SW of 27-6n-13e, a wildcat in Catahoula Lake, La Salle Parish, Louisiana.

FRANK BRAHANEY, Abilene, Tex., has the contract for a 7,000-ft. test to be drilled in Schleicher County, Texas. The test is Cooper Gas 1 D-39 Bert Page, in Section 39, Block L, of G.H.&S.A. Survey, northwest outpost of the Page field. Last week operators were rigging up heavy tools after spudding to 449 ft. and setting surface pipe.

BIG CHIEF Drilling Co. has the contract for Danciger Oil & Refining Co. 1 Province, in NW NW SW of 4-20n-2w, north of Lucien pool, in Noble County, Oklahoma. Tools were being moved in last week.

R. E. KENNEDY, Kilgore, Tex., has the drilling contract for J. M. Hayner 1 Conley-Garland, NE of 8-21n-15w, in the Caddo area of Caddo Parish, Louisiana.

G. R. NEIGHBORS has the contract for Union Producing Co. 1 Morehouse Parish School, SW 16-22n-4e, the Monroe area of Morehouse Parish, Louisiana.

ALLEN & MORRIS, San Antonio, Tex., have started work on a 7,000-ft. test on the west side of the Odem field, San Patricio County, Texas, for Continental Oil Co. The well is 1 E. C. Caldwell, about 3,600 ft. from production.

MILAM Drilling Co., San Antonio, Tex., has started operations on Atlantic Refining Co. 1 Martex-Welder, a wildcat 3 miles west of the Fitzsimmons field, Duval County, Texas.

E. A. GRAHAM, Corpus Christi, Tex., received contract for Earl Calloway 1 A. Parr, a Cockfield sand test 8 miles southeast of Benavides, Duval County, Texas.

AL BUCHANAN Drilling Co., San Antonio, Tex., has moved a rotary to the Rooke field, Refugio County, Texas, for Plymouth Oil Co., and is preparing to spud 1 E. H. Welder. The test is about 2,000 ft. northeast of the discovery well.

CARTER Drilling Co. has reached a depth of approximately 7,800 ft. in Tide Water Associated Oil Co. 1 Imogene Hall, a Wilcox test 2 miles northwest of Tuleta, Tex., and is scheduled to abandon. Tight sand with an oil and gas show was reported cored at intervals from 7,649-66 ft., but the section was not thick enough to warrant testing.

MARKLEY-BANKHEAD, Inc., Houston, Tex., completed a second producer in the newly opened deep sand at the University field, East Baton Rouge Parish, Louisiana, for the Sugarfield Oil Co. The well is 4 Richard-Community, which was completed in sand at 9,388-9,415 ft. Total depth of the well is 9,696 ft. with 5½-in. casing cemented at 9,400 ft. The company's 1 Iberville Land Co., in the Happytown field, Iberville Parish, Louisiana, has been abandoned at contract depth of 11,000 ft.

HOUSTON Drilling Co., Houston, Tex., is starting a new operation in the South Ganado field, Jackson County, Texas, for the Gulfboard Oil Co. The well is 2 Harmon, 1,320 ft. due east of the discovery well, recently completed in the Frio sand at 5,300 ft.

KNOX Drilling Co., Houston, Tex., is coring for the pay on Boyle & Mayo 1 Hofner, an outpost in the Mayo field, Jackson County, Texas.

R. T. MYERS was scheduled to start drilling May 14 at J. D. Parsons et al 1 W. F. England, a wildcat ½ mile southeast of Commerce in Hunt County, Texas, on a location in the Marler Survey.

FRANK WOOD, Wichita Falls, Tex., has the contract for Texas Co. 5-F Mallett, 580 ft. from south and east lines, Labor 14, League 51, Scurry County School Land Survey, one of several wells under way in the Slaughter field of Cochran and Hockley counties, Texas, for the Texas Co.

GROVER & ROSE, Albany, Tex., have the contract to drill a wildcat in southeastern Shackelford County, Texas, for R. H. Roark, 2½ miles north of Sedwick, Tex. The test is in the W. H. Green lands and is scheduled to test the Ellenburger at around 4,300 ft.

DENVER Drilling Co., Tulsa, was to move in rig this week to drill Brown-Hancock 1 R. L. Warren, a 3,000-ft. Woodbine sand test about 4 miles southwest of Terrell in Kaufman County, Texas. Location is on a block of 6,000 acres running in a northeast-southwest direction on the outer rim of the Balcones fault system and generally in the path of extensive leasing that has taken place along the Smackover trend. Brown-Hancock took the drilling deal for half the block.

J. O. FOX & SONS, Dallas, Tex., have an interest in Holland & Huffman 1 Bailey, a new lime-pay discovery for Coleman County, Texas, which they drilled. The well is 1 mile east of Camp Colorado.

Contractors

HALKO Drilling Co. has the contract for Jordan Petroleum and Atlantic Refining Co. 1 Pecore, in NE NE SE of 34-10n-3e, west of production in Pottawatomie County, Oklahoma, which was drilling below 4,800 ft.

PARKER Drilling Co., Wichita, Kans., is reported to have the drilling contract for a test in north Dallam County, Texas, which Pure Oil Co. and Gulf Oil Corp. will jointly operate. The test will be 11 miles north of Ware.

TAGGERT Brothers Drilling Co., Mount Pleasant, Mich., has secured approval of the OPC to drill 82 gas wells in different areas of Michigan. As gas is greatly needed for defense plants the wells will be drilled on a 1-well-to-40-acre basis.

OLSON Drilling Co., Tulsa, will be the contractor for Carter Oil Co. 1 Semling, C SE SE of 18-141n-81w, in the Bismark area of Oliver County, North Dakota. Located on the Walther block, it will seek the Deadwood formation at 7,000 ft. This is equivalent to the Ordovician in Oklahoma and Kansas. Olson will move a diesel drilling machine there from southeastern Montana.

●

Army Seeking Drillers And Roughnecks

DRILLERS and roughnecks formerly employed on rigs now stacked because of the drilling curtailment will be interested in learning that the U. S. Army is looking for 15 to 20 men with experience on rotary rigs. These men are needed for work at a proving grounds in the eastern United States where new equipment for the Army is being tested. Much of the work done at the proving ground requires experience similar to that gained in oil-field drilling.

Anyone wishing to apply can obtain further details by writing to the Engineer Board, Fort Belvoir, Va., attention of Lt. T. C. McGuire. Experience, age, and minimum acceptable annual salary based on 40 hours per week should be stated briefly in the letters of application.

●

Contractors' Problems Reviewed by Mills

BRAD MILLS, secretary, National Drilling Contractors Association, Dallas, Tex., addressed a group of 65 contractors at Bradford, Pa., last Thursday evening. The meeting was conducted by the Appalachian Drilling Contractors Association, of which L. R. Oakes, of Mount Jewett, Pa., is president. Mr. Mills told his audience that drilling contractors are faced with the problem of the cost of intangibles, without a thorough knowledge of which their future relation with producers is threatened. He stressed the importance of good records and accurate bookkeeping as a means of meeting the unusual conditions confronting the drilling fraternity today.

The Government has urged the national association to complete inventories of all material and be able to talk figures with the OPC and OPA, he reminded his hearers.

He said that whereas 31,000 completions were reported last year, this year, for various reasons, the total would not reach much more than half that figure. This has brought about a radical change throughout the country. Drillers have gone into other industries. The war draft is taking others. Where to get drilling employes in the event conditions return to normal is only one problem to disturb the industry. Transfer and pooling of tools may be a problem to confront the industry, he warned.

Kerlyn Drilling Co. crew on location in Oklahoma City. E. W. Koester, Eastman Oil Well Survey Co., is at left. The other men are Bill Sawyer, derrickman; Tom Brown, driller; D. C. Lindley, backupman; Marvin Whited, catheadman; Bud Smith, pipe racker, and Clay Walton, fireman

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Personal Paragraphs

RAY TATE has replaced FRANK LOVERING as district superintendent for Phillips Petroleum Co., at League City, Tex.

J. E. CLAYTON, superintendent of Humble Oil & Refining Co.'s repressuring plant in the Lovells Lake, Texas, field, has been transferred to the company's recycling plant now under construction at the Katy gas field as superintendent. JOHN R. CARROLL succeeds Mr. Clayton at the Lovells Lake plant.

RALPH JOHNSON, independent operator, Houston, Tex., is recuperating in a Houston hospital from a recent operation.

R. W. REED, geologist, formerly with the National Development Co. in the Philippines, has joined the geological department of the Texas Co. at New Orleans, La.

PAUL GAURIN, assistant manager of the production department in the Gulf Coast division for Shell Oil Co., Inc., received a commission as major in the U. S. Army, and left last week for active service.

JOHN S. IVY, Houston, Tex., formerly vice president of United Gas Co., last week addressed the final meeting of the Shreveport Geological Society. His address was on the Tinsley field, of Mississippi.

W. W. ZINGERY, president of the Zingery Map Co., and H. R. CLARKE, civil engineer, Houston, Tex., have organized the Zingery-Clarke Engineering Co., with headquarters at Houston, Tex.

JOE T. DICKINSON, head of the legal department, Shell Oil Co., Inc., Houston, Tex., received his commission as major in the United States armed forces, and left last week for active service.

L. R. HOLMES, of Texas Co., who is in charge of the refining department in California, recently completed 39 years of active service with the company, his early years being spent with the parent company.

O. P. NEWMAN, deputy supervisor of the Houston office of the Texas Railroad Commission, has resigned to engage in business for himself. VAILE HENRY, formerly located at Austin, has been transferred to Houston to succeed Mr. Newman.

H. D. COLLIER, J. H. TUTTLE, R. C. STONER, J. L. HANNA, J. H. MacGAREGILL, F. S. BRYANT, R. G. FOLLIS, ATHOLL McBEAN and A. N. KEMP were all reelected directors of Standard Oil Co. of California at the annual meeting of the company held in San Francisco. Missing from the board of directors are R. K. DAVIES and P. H. PATCHIN, vice presidents, the former being on leave of absence and the latter being assigned to headquarters in the nation's capital. All officers were reelected.

BOB TILLERY, tool pusher for Delta Drilling Co. in the Chapel Hill field, is in a Dallas, Tex., hospital as a result of recurrent trouble from a leg injury received some years ago.

CECIL PROVINE, formerly tool pusher for Rowan Drilling Co. in West Texas, with headquarters at Plains, Tex., is now an Army private at Fort Bliss, Texas. His former territory is now being handled by J. L. DE VAULT.

M. R. McARTHUR, division superintendent in the Gulf Coast division for Phillips Petroleum Co., at Houston, Tex., has been transferred to the company's offices at Bartlesville, Okla. D. P. ETHRIDGE, formerly superintendent for the company at Corpus Christi, Tex., has been transferred to Houston to succeed Mr. McArthur.

W. K. ATCHESON, superintendent of the automotive department, southwestern producing division, Pure Oil Co., Tulsa, is winding up his affairs to report to the U. S. Army Quartermaster Corps, at Camp Holabird, near Baltimore, Md. His rank will be major. Major Atcheson served as a chief petty officer in the first World War. LEO HUFF, manager of all automotive equipment for Pure, is coming to Tulsa to check Major Atcheson out.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

In the House of Representatives in Washington, Mr. Carter, of Oklahoma, has introduced a bill authorizing the secretary of the interior to collect and publish statistics on the production, manufacture and marketing of crude petroleum.

Expansion of the Midwest Refining Co.'s capacity during the past few months in Wyoming has made this concern the fourth largest manufacturer of gasoline in the country.

Large gasoline and oil-producing companies of the Southwest have agreed to furnish the U. S. Government certain quantities of fuel oil at seaboard points in emergencies.

20 YEARS AGO

The Prairie Pipe Line Co. has shut down its Mexia, Tex., pipe line and will run the crude, which it has been taking and moving northward, to the Prairie Oil & Gas Co.'s storage in that field.

The Royal Dutch Petroleum Co. has instructed the management in the Netherlands Indies to resume exploitation work on several areas in Sumatra. Operations were suspended some time ago owing to excessive export duties.

Henry S. Morton, first vice president of Standard Oil Co. of Indiana, has retired from active service. Mr. Morton was with the company for 36 years.

10 YEARS AGO

Rationing of gasoline throughout Chile for "strictly necessary" purposes is planned as an economic measure under regulations for control of foreign exchange. The government has determined to prevent the outflow of gold except where absolutely necessary.

The oil industry of the United States will be asked to take the lead in "breaking the vicious circle in the export markets which has resulted in wasting the oil riches of the earth outside the United States," by J. B. Aug. Kessler, of Royal-Dutch Shell, here for the international oil conference.

W. O. KELLER, petroleum engineer for Stanolind Oil & Gas Co., has been transferred from the Fort Worth offices to Wink, Tex.

BAKER B. INGRAM, junior petroleum engineer for Humble Oil & Refining Co., has been appointed district petroleum engineer in the Wasson district.

ED LOGGINS, district electrical foreman in the North Crowley, Texas, field for Humble Oil & Refining Co., has been transferred to the Paradis, Tex., district.

H. C. HUMPHREY, production foreman in the Manvel field for the Texas Co., has been transferred to the Pierce district in Wharton County, Texas.

D. L. FERGUSON, general superintendent of the Standard Oil Co. of New Jersey Bayway refinery, is the 1942-43 president of the Linden, N. J., Industrial Association.

JACK WRATHER, oil man of Tyler, Tex., is winding up his business and will enter the Army under the volunteer officer training program if his application is accepted.

WALTER L. RUGEL, who has been a stillman at Shell Oil Co., Inc.'s Dominguez, Calif., refinery, in the cracking division, has been appointed assistant department manager, cracking division, at the same plant.

JOHN C. SAMPLE, who joined Socony-Vacuum Oil Co., Inc., in November 1920 as marketing assistant in Kobe, Japan, and subsequently spent 18 years in foreign service of the parent company, has been appointed general sales manager of the marketing department of General Petroleum Corp., and will make his headquarters in Los Angeles.

J. E. DICKINSON, land man and scout at Midland, Tex., for Sun Oil Co., has become an independent operator.

BOSE GORMAN, petroleum engineer for Gulf Oil Corp. in the Fort Worth, Tex., offices, has been accepted for service in the Army Air Corps and is daily expecting a call to active duty.

CONGER REYNOLDS, public-relations division chairman of Standard Oil Co. (Indiana), has been appointed a member of the executive group who will supervise some 3,000 volunteer workers of the second war fund campaigns for United Service Organizations, which was launched in Chicago, May 11.

W. K. WARREN will be honored May 16 at a dinner dance being arranged by the Warren Petroleum Corp. Activities Association, for his 20 years of leadership of the company. R. C. PATTISON is general chairman of the affair. The company will award service pins to 30 office employes and a number of field employes.

ROSS GAHRING, president of Ross Oil Co., Shawnee, Okla., whose bravery under fire in the first World War won him 13 decorations from Allied governments including the first D.S.C. ever given an American soldier on United States soil, has been summoned for duty, and will report May 17 at Fort Sill, Oklahoma.

Varied Oil Interests

James W. Johnson, newly elected president of the newly formed Montana Oil and Gas Producers Association, is a native Montanan, who has been in the oil business ever since he was released from the Army in 1919. Only 42 years old, he is president of Consolidated Gas Co., president of Producers Refining Co., and is Montana manager for Toronto Pipe Line Co. and British American Oil Producing Co.

JAMES W. JOHNSON

Mr. Johnson's oil experience covers connections with a number of other companies. He was formerly secretary-treasurer of Johnson Signal Hill Syndicate, vice president of Shelby Pipe Line & Refining Co., and executive vice president of Northwest Stellarene Co. He organized Producers Refining Co., in 1937. The activities of this company include purchasing, refining, and marketing crude oil through a marketing contract with Socony-Vacuum Oil Co., Inc., and refining contract with Glacier Production Co., Cut Bank, Mont.

Mr. Johnson professes to a variety of hobbies and recreations, including boating, fishing, and golfing.

LEONARD F. McCOLLUM, president, Carter Oil Co., has been elected trustee of University of Tulsa.

HARRY C. HANSZEN, Houston, Tex., oil operator, has been elected a member of the board of trustees of Rice Institute.

L. R. BURNETT, field superintendent for Simpson-Fell Oil Co., Ardmore, Okla., has been named a field man in the war-bond pledge campaign for southern Oklahoma.

A. H. MITCHELL, personnel director, Carter Oil Co., will address a meeting of tax representatives of the Kansas-Oklahoma area, Mid-Continent Oil and Gas Association, May 15.

R. S. CHRISTIE, of Fort Worth, Tex., division engineer for Amerada Petroleum Corp. in Texas and New Mexico, has left to report at San Diego, Calif., as first lieutenant in the Coast Artillery.

J. J. ARPS, district engineer for British American Oil Producing Co., has been appointed production superintendent for the Gulf Coast district, Houston, Tex.

L. S. REED has been elected vice president of Texas Gulf Producing Co., Houston, Tex., succeeding F. W. Dumraese, recently killed in an automobile accident. G. G. REED has been reelected president; W. H. HENDRICKSON, reelected secretary-treasurer, and T. S. TALIAFERRO, assistant secretary.

E. D. RODGERS, formerly an engineer in the East Texas field for Stanolind Oil & Gas Co., has resigned his position to enlist in the Army.

HARVEY A. DEARDORFF, chief engineer of the Bayway pumping station of the Tuscarora Oil Co., Ltd., has received his 40-year service emblem. Mr. Deardorff went to work as a pipe liner with the Southern Pipe Line in 1900.

V. P. SHELDON, formerly field engineer in the Texas Panhandle, has been made assistant division engineer at the Fort Worth offices of Stanolind Oil & Gas Co. Mr. Sheldon replaces LT. ROBERT W. TESCH, who is now in the service.

A. P. CALLAHAN, formerly petroleum engineer at the Pampa, Tex., offices of the Texas Co., left last week for Fort Sill, where he becomes a first lieutenant. In January Mr. Callahan replaced H. W. BENISCHEK when the latter was transferred to the Fort Worth offices of the company.

T. R. ARMSTRONG, officer and director of several Standard Oil Co. (New Jersey) foreign subsidiaries, and T. E. BROWNFIELD, formerly head of the scouting department of Carter Oil Co. but now with the parent organization in New York, stopped in Tulsa this week while on a general inspection trip that will take them to most of the Mid-Continent and Gulf Coast operating centers.

R. E. CHANNOCK has been elected treasurer of National Refining Co., Cleveland, Ohio. Mr. Channock advances to his new position after serving for the past 2 years as assistant treasurer. Since 1926, when Mr. Channock joined the company as internal auditor, he has held the position of traveling auditor, tax man, head of the general accounting department and assistant secretary and treasurer.

CLYDE L. ROBINSON, division engineer for Gulf Oil Corp. at Fort Worth, Tex., is recovering from an operation at a Fort Worth hospital, and will be back at his desk in 2 or 3 weeks.

ROBERTSON D. WARD, former treasurer of Carnegie Corp., New York City, has been named assistant to the president of Freeport Sulphur Co. RICHARD C. WELLS has been appointed assistant treasurer.

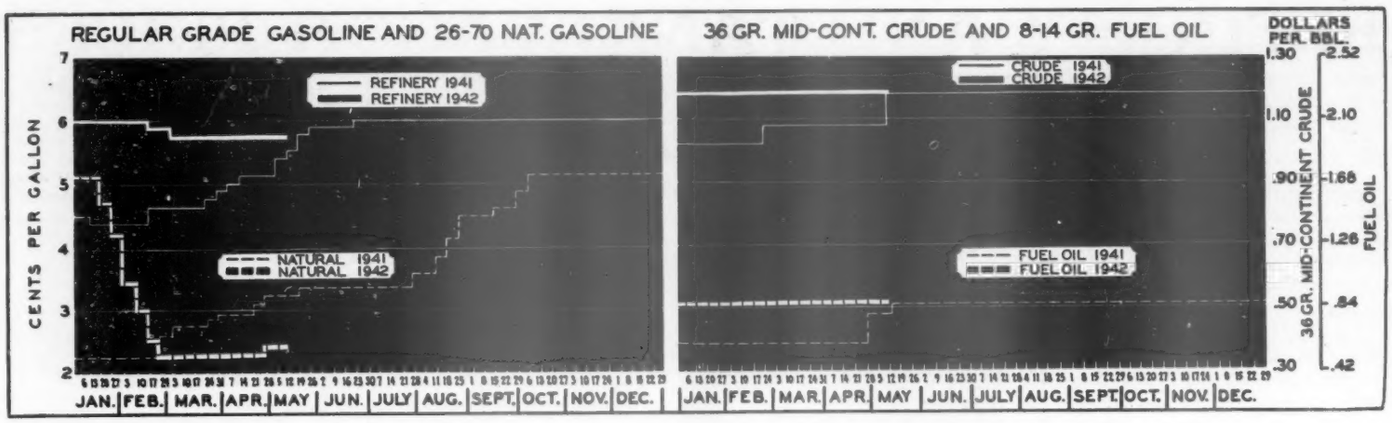
Shifts: R. S. CROCKETT, superintendent. Gulf Oil Corp., Philadelphia to Drexel Hill, Pa.; HENRY A. JACKSON, engineer, Magnolia Petroleum Co., Andrews, Tex., to Eunice, N. M.; A. W. SPECKELS, engineer, Texas Co., Cameron to Cuero, Tex.; J. W. BARTLETT, superintendent, American Liberty Oil Co., Blessing to Grapeland, Tex.; JACK BIBB, Bibb Contracting Co., Valley Park, Mo., to Flint, Mich.; O. C. HOWELL, drilling contractor, Hawkins & Howell Drilling Co., Jackson, Miss., to Tyler, Tex.; CRAIG FERRIS, geologist, Mott-Smith Corp., Mendenhall, Miss., to Wichita, Kans.; H. D. CHRISLIP, engineer, Gulf Oil Corp., Lyons, Kans., to Tulsa; J. D. TURNER, geologist, Carter Oil Co., Kearney, Neb., to Seminole, Okla.; R. D. JOCOY, superintendent, Harry Bass Drilling Co., Hobbs, N. M., to Seminole, Tex.; CARL COOPER, superintendent, Cooper Drilling Co., Mineola, Tex., to Marlow, Okla.

DON DAWSON, who went to work for General Petroleum Corp. in January 1920, as a scout in the land department, has been elected vice president of Socony Paint Products Co., and in his new capacity will have full charge on the Pacific Coast.

GOLDIE S. WILLKIE, formerly in charge of drilling for Magnolia Petroleum Co. at Victoria, Tex., has been made drilling superintendent for his company in East Texas and is establishing headquarters at Kilgore. At the present time he is supervising the drilling of a Chapel Hill well and also the second well of Magnolia's Anderson County discovery.

J. A. (JAKE) MOLLER, who recently completed 30 years of service with the Texas Co., was honored at a dinner in Long Beach, Calif., on the occasion of his retirement from active duty. The last few years of his service were spent in the capacity of production superintendent of the Pacific Coast division. The dinner honoring Mr. Moller was tendered by 250 of his friends in the oil industry.

Several operating men from Skelly Oil Co. gathered at Wichita, Kans., last week to discuss wartime industrial problems. The meeting brought together P. E. COSPER, Falls City, Neb., superintendent for Nebraska; J. C. CREEDEN, Hutchinson, Kans.; O. M. EVANS, Tulsa, production engineer; H. M. STALCUP, Tulsa, vice president for production; J. M. STERRIT, Carmi, Ill., superintendent for Illinois, and H. M. WALMSLEY, Hutchinson, superintendent for western Kansas.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK.—Word of the plan to subsidize railroad shipments of oil into District 1 was received with mixed feeling by the oil companies. Approximately a score of companies are now operating as participants in the tank-car pool. The opinion seems to be that while the industry is decidedly opposed to accepting government aid even in this emergency, the losses are too great for the oil companies to continue to absorb and that some relief, regardless of its form, is necessary to prevent the collapse of some companies.

The subsidy, to be granted by the Reconstruction Finance Corp., will also apply to tankers when shipments by this means are resumed, it is believed. Losses sustained by the oil companies in operating tankers during the first quarter of the year are estimated roughly at $50,000,000, while losses on tank-car shipments are reported to average between $200 and $250 per car. With loadings nearing 3,000 cars per day, the magnitude of this loss is apparent.

Reports that nonessential consumers of gasoline would be restricted to 3 gal. per week were received with enthusiasm by distributors in view of earlier predictions of 5 to 6 gal. In view of the critical need for other products for essential uses and because of the tremendous costs to the industry, economists are of the opinion that nonessential consumption should be eliminated entirely.

Exclusion of western Pennsylvania and West Virginia from the rationing area was approved by refineries supplying those sections because they were faced with a serious problem of excess gasoline supplies. Stocks had been accumulating in this area since deliveries were first restricted.

Mid-Continent

QUOTATIONS for all refinery products in the Mid-Continent continued steady this week while plant operators attempted to appraise impacts on the market of various changes ordered and others in prospect in the muddled transportation situation.

Movement of motor fuel into the eastern territory continued unabated and suppliers were paying the going prices without argument. Shipments of fuel oil will be increased materially during the remainder of May and for an indefinite period in the future under a series of moves, including: (1) Establishment of joint tank-car committees to increase eastern movement of burning oils; (2) directive from the OPC, instructing District 2 refiners to reduce gasoline yields and increase fuel-oil recovery from crude and (3) concentration of buying efforts on fuels.

Refiners in the Mid-Continent reported varied response to the OPC request for modification of gasoline yields. Some reported that action had been taken voluntarily before the OPC recommendation was issued and others said they would balance out May operations by more drastic adjustments, if necessary, at the end of the month.

Calls from northern jobbers for kerosene, range oil, and tractor distillate continued this week in reasonable volume. Supplies are adequate to meet the demand and there are no indications of early price improvement.

First substantial reductions in the consumption of motor fuel, particularly in the Middle West, are being reflected in current reports of station gallonage. Refiners, however, are unwilling to accept incomplete and perhaps unrepresentative sales reports as indicating a definite trend.

Natural gasoline held firm at 2.375 cents per gallon on 26-70 material in Oklahoma for northern shipment. Texas manufacturers were quoting 2 cents for the same grade.

SENTENCE SUMMARIES

MID-CONTINENT: Prices on all products steady. Refiners watch reaction of transportation changes.

GULF COAST: Stocks continue rise. Crude buyers cut runs from low-octane fields. Deeper cuts in refinery operations imminent.

EAST COAST: Efforts concentrated on inshipments of more fuel oil. Relief sought from unbearable transportation losses.

PENNSYLVANIA: Movement of surplus gasoline main problem. Demand absorbs all current production of lubricating oils.

PACIFIC COAST: Fuel and diesel oils firm and in strong demand. Motor-fuel prices recover slightly with termination of distress selling.

A.P.I. REFINERY REPORT

Week Ended May 2, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
Appalachian	160	3,995	628	382
Ind., Ill., Ky.	703	21,842	3,383	2,558
Okla., Kans., Mo.	355	10,072	1,663	886
Censored group*	1,549	45,807	15,694	13,943
Rockies	83	2,481	583	293
California	590	17,179	57,988	11,576
Total May 2, 1942	3,441	101,376	79,939	29,638
Total Apr. 25, 1942	3,506	102,897	81,107	29,240
Total May 3, 1941	3,772	95,823	91,889	32,021

Note: Refinery runs and stocks for week ended May 9, 1942, appear on Trends page.

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended	Bbl. of crude*
May 2, 1942	259,145,000
Apr. 25, 1942	257,073,000
May 3, 1941	265,728,000

*Excludes heavy-unrefinable stocks in California.

Gulf Coast

HOUSTON, Tex.—Tanker movement from the Gulf Coast was stopped this week as the result of submarine activity in the Gulf of Mexico which resulted in the sinking of two merchant ships. All ports were closed and no information is available when shipping might be resumed.

While tanker movement has been restricted during the past several months, complete stoppage of this movement has made the Gulf Coast refinery situation more acute. Movement of material will now depend entirely upon tank trucks, tank cars and barges. While tank-car and barge movement has been increased the volume is not sufficient to take care of reduced refinery runs and additional reductions are expected.

There has been no improvement in the crude situation. Effective May 7, Texas Co. announced a 50 per cent reduction in its purchases in the Corpus Christi area. The announcement followed a similar cut by Humble Oil & Refining Co., and the Amsco Pipe Line Co., which discontinued all runs from fields producing low-octane crudes.

There was no change in quotations for 72-74-octane gasoline, although concessions were being made to buyers who could furnish tank cars. Kerosene was still strong, although quotations were unchanged.

The Gulf Coast Refinery Association reported that gasoline inventories as of May 1 totaled 3,000,597 bbl., an increase of 239,023 bbl. since April 15. Crude runs amounted to 1,533,873 bbl., an average of 102,248 bbl. per day or 62.5 per cent of capacity which is a slight decrease and is in line with OPC's request to reduce runs.

Pacific Coast

LOS ANGELES, Calif.—Gasoline is up fractionally chiefly because much distress selling has been eliminated by consolidation of operations of several Pacific Coast refining companies. Four plants have been shut down and a fifth is now processing all crude and delivering refined products back to participants.

Hancock Oil Co. has shut down its Long Beach refinery and may probably make some kind of an arrangement similar to the above although this is not definitely certain.

The small differential between crude and refined-oil prices has closed about 25 small refineries in California during the past 2 years. Additional plants may cease operations when service stations begin closing later this year.

REFINERY AND TANK-WAGON PRICES

(Prices as of May 12)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	.....	5.500-5.625	.....	5.125-5.250	4.750-4.875
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast	9.700	.....	.....	9.200	9.200	.....	.....
Pacific Coast	.....	6.500-6.750	6.125-6.250	6.250-6.500	5.750-6.250	5.25-5.50	4.75-5.00

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	2.375	2.750-2.875	.....
North Texas	2.000	2.375-2.500	.....
North Louisiana	2.125	2.500-2.625	.....
California	.....	.....	5.000-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500-4.750	4.375-4.625	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-6.000	4.500
Northeast Coast	.....	.....	.....	5.700	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	‡$1.35-1.45	$0.85 0.90
California	.....	2.750-4.000	.....	.....	1.85	1.80
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast	.....	.....	.....	5.800	2.222	1.80
North Louisiana	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.500-3.625	3.375-3.500	$0.85	$0.85
Pennsylvania (West)	5.625-5.875	5.375-5.875	†5.250-5.500	.....
Northeast Coast	5.8	5.8	1.85	1.80
Pacific Coast	5.5	5.5	‡0.80-95	§0.80
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
650 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Neutral Oil

CALIFORNIA—		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		38.50
10 pour point		37.50
15 pour point		36.50
25 pour point		31.00
200 vis., at 70° F., 3 color:		
Zero pour point		40.50
10 pour point		39.50
15 pour point		38.50
25 pour point		33.00

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

NEW YORK—

Wax in bags fully refined:	
130-132 (A.m.p.) wax	6.250
133-135 (A.m.p.) wax	6.550
Crude scale:	
124-126 (A.m.p) w.s.	4.350-4.455
124-126 (A.m.p.) y.s.	4.350-4.455

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel			Bunker
	41-43	24 G.	48-52 D.I.	58 D.I. Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375 $1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	.....	..... †1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8	.....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Baltimore, Md.	15.05	5.50	9.10
Boston, Mass.	14.50	4.50	8.40
Burlington, Vt.	16.50	5.50	.....
Buffalo, N. Y.	15.80	5.50	9.20
Dover, Del.	16.30	5.50	10.80
Hartford, Conn.	15.20	4.50	.....
Manchester, N. H.	16.90	5.50	9.40
Newark, N. J.	14.30	4.50	8.30
New York, N. Y.	15.70	5.50	8.40
Philadelphia, Pa.	15.80	5.50	10.55
Pittsburgh, Pa.	16.30	5.50	10.90
Portland, Me.	15.90	5.50	8.50
Providence, R. I.	14.60	4.50	8.20
Washington, D. C.	14.30	3.50	9.60
Average 14 cities	15.51	5.07	9.28

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Chicago, Ill	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.03	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky and Louisiana)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Atlanta, Ga.	19.00	7.50	9.40
Birmingham, Ala.	19.60	8.50	9.00
Charleston, S. C.	18.55	7.50	.....
Charleston, W. Va.	18.85	6.50	11.90
Charlotte, N. C.	19.70	7.50	9.90
Jacksonville, Fla.	19.00	8.50	8.40
Jackson, Miss.	18.00	7.50	8.50
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn	17.75	8.50	10.50
New Orleans, La.	17.25	8.50	*10.00
Norfolk, Va.	17.05	6.50	10.60
Average 11 cities	18.34	7.59	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.53	5.96	10.30
Average last week	16.37	5.96	10.30

Canadian Fields

(Continued from Page 125)

Consolidated 8 (formerly Hamers 3) is flowing 80 to 110 bbl. daily. Vermilion Consolidated 9 Hamers is cleaning out and has started flowing, with a good producer indicated. Vermilion Consolidated 1 O'Sullivan, LSD 3, 6-51-5w4, has derrick up, and will test a new section of the field to the north. Princeville Petroleum 2, LSD 1, 31-50-5w4, has installed standard pumping equipment and is on production. Midfield Petroleum 1, LSD 6, 14-50-6w4, south and west of the producing area, is coring below 1,600 ft.

ONTARIO COMPLETIONS

Chatham Township: Union Gas 59, Lot 15, Concession 10, T.D. 1,630 ft., dry.

Malahide Township: Union Gas 85, Lot 26, Concession 7, T.D. 1,075 ft., dry.

Test Delaware Area

In Delaware Township, Middlesex County, Union Gas Co. 4 has spudded in Lot 6, Concession 1. Tests drilled by Leo Wilson and associates of Sarnia in the same general area more than 30 years ago encountered gas in considerable quantities, but owing chiefly to water troubles the flow was not utilized. It is thought a gas field may be found in the Guelph-Niagara limestone, the producing formation of the Malahide and Tilbury fields.

Crude-Oil Prices

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	3.00

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

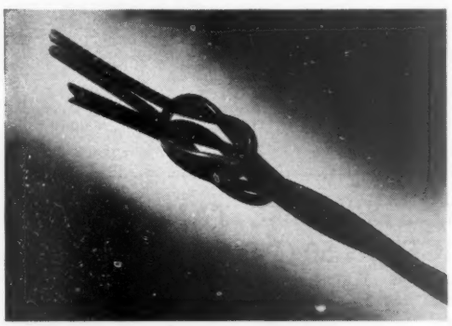
Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas*
18-18.9	$0.80	...	$1.06	$0.70
19-19.9	.84	...	1.06	.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.02
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.06
38-38.9	....	1.21	1.44	1.06
39-39.9	....	1.23	1.46	1.10
40 and above	...	1.25	1.48	1.12

*Includes Lea County, New Mexico.

EQUIPMENT PROGRESS...

Saran Plastic Fabricated Into Flexible, Semitransparent Tubing

Saran plastic is now being fabricated into a flexible, semitransparent tubing. The resistance of this material to water, gasoline, oils, chemicals and solvents, combined with its toughness and ability to withstand abrasion, qualify it for substitution in many instances for critical war materials such as copper, nickel, stainless steel and ceramics.



The material from which this tubing is made is a vinylidene chloride resin developed by Dow Chemical Co.

This thermoplastic is entirely unaffected by water and the only solvents exhibiting any effect on the plastic are the high oxygen-bearing oxides and ethers and certain of the chlorinated aromatic hydrocarbons. The extreme resistance of the resin to most acids and metallic alkalies, concentrated or dilute, at room temperatures permits industrial applications heretofore thought to be impossible.

Saran tubing is available in sizes from ⅛ in. to ¾-in. o.d. in wall thicknesses of 0.031 in. and 0.062 in. Larger sizes and greater wall thicknesses will be available soon. The tubing will accommodate Parker standard tube couplings, S.A.E., and other flare-type fittings. At normal room temperatures, the flaring can be done with standard copper-tubing flaring tool. Any necessary cuttings or trimming can be done with a knife, scissors or file. Straight flare-type fittings made from Saran are now available. Tees, ells and other fittings are now in the process of manufacture. Saran has good machining qualities and will be available in round and hex stock.

To illustrate the strength of this tubing, the ¼-in. o.d. size in wall thicknesses of 0.031 in. and 0.062 in. has bursting pressures of 630 lb. and 1,840 lb., respectively.

Saran tubing is recommended for continuous temperatures to 150° F., although a ¼-in. o.d. tube with 0.035-in. wall did not bulge or rupture when heated to 212° F. and subjected to 200-lb. per sq. in. air pressure for 13 hours.

In demonstrating Saran's resistance to fatigue, tubing was flexed through an angle of 15°, 1,750 times per minute for 2,500,000 cycles without a failure. In comparison, standard ¼-in. copper tubing failed after about 500 cycles in the same test.

Saran is a poor conductor of heat, compared to metals, and can be used as electrical insulation.

Listed here are some of the suggested uses of this tubing:

1. Oil lines for motors having central oil systems.
2. Gasoline lines for automobiles.
3. Tubing for recording devices and gages.
4. Siphon tubes for acids, alkalies and organic materials.
5. Lead-in pipes for corrosive fluids.
6. Atomizer tubes.
7. Refrigerant transfer.
8. Electrical insulation.
9. Sight tubes.
10. Humidifier supply lines.
11. Air and water lines.

Since no critical war materials are used in the manufacture of Saran, a preference rating is not required to obtain delivery.

Complete information on Saran tubing will be promptly forwarded upon receipt of request mailed to the Warner Lewis Co., P.O. Box 3096, Whittier Station, Tulsa, distributors for the Southwest.

Broderick & Bascom Rope Co. Awarded Navy "E"

Sixty-six years of continuous improvement in its manufacturing methods, coupled with a remarkable spirit of cooperation among its employes, won the Navy "E" for the Broderick & Bascom Rope Co., St. Louis, Mo.

The two-pointed all-Navy burgee with a white "E" and anchor in the center—highest honor the U. S. Navy could give the company—was presented at fitting ceremonies held at the plant April 30.

Capt. Edwin A. Wolleson, U.S.N. (retired), commanding officer, Navy Pier, Chicago, made the presentation. John K. Broderick, president of the rope company, accepted the burgee in behalf of the management, staff and personnel.

In accepting the award, Mr. Broderick emphasized that it had not been won by any concerted effort at

a production record and that, in fact, none of the employes knew the company was being considered for the honor.

Jack Schneider, 64, foreman of the stranding department, who started with the company as a boy, and Joe Saettele, foreman of the splicing department, accepted "E" buttons in the name of all company employes.

This is the second time Saettele has won such an award. The first time was in 1905 when he was a member of a gun crew aboard the U.S.S. Baltimore, which broke the Navy record for operating a 6-in. gun by scoring nine hits in 1 minute.

William Dee Becker, mayor of St. Louis, and Lloyd C. Stark, former governor of Missouri, two of the many notables present, made brief addresses. Music was furnished by the Navy Pier band.

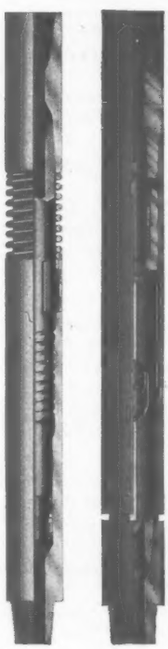
In the evening, officials of the company and Navy officials celebrated the event with a banquet.

Cooper-Bessemer Expands Plant

New buildings and equipment, which will practically double its productive capacity of diesel engines are reported being erected by Cooper-Bessemer Corp., Mount Vernon, Ohio, at its Grove City, Pa., plant. Announcement was made by B. B. Williams, Cooper-Bessemer president and board chairman. The project is financed under a plant facilities contract authorized by the Bureau of Ships, Navy Department.

Baash-Ross Develops Two New Tools to Safeguard Drill Strings

Two important new developments that are of particular interest to oil operators at this time have recently been announced by Baash-Ross Tool Co.



One of these new tools, the Baash-Ross Drilling Type Bumper Sub, enables the operator to jar his way out of trouble and is particularly recommended for use in sticky formations, key seats, etc. The second tool, the Baash-Ross Type "E" Autolock Safety Joint, is particularly recommended where formations are apt to cave, making jarring operations of no value. With this joint the operator can unscrew the string above the stuck portion, thus insuring recovery of at least a major portion of the pipe.

The Bumper Sub is run as a part of the drill string, directly above whatever point is apt to stick—the bit, reamer, collar, etc. With it the operator can strike either a downward or upward blow to free the string. Operation is simple and the blow is under positive control of the operator at all times.

The tool has been particularly designed to meet the requirements of modern drilling operations. It is made of carefully selected steels, heat-treated to produce maximum physical properties, and will stand any force—in either direction—that the drill string is capable of delivering. The splined area through which the torque load is transmitted is rugged and oversize to give ample strength for the most severe operations. In addition, the tool has removable splined inserts that may be quickly replaced when worn, thus insuring long life and low maintenance.

The Bumper Sub is sealed against leakage by a packing arrangement that is especially designed to hold even high circulating pressure without leakage —a feature that is particularly important in modern drilling operations.

The Baash-Ross Bumper Sub is available in both right and left-hand types in all popular drill-pipe sizes, including both regular and full hole.

The Baash-Ross Drilling Type Safety Joint can be used at any point in the drill string, is made to rotate in an unscrewing direction without danger of accidental release . . . yet it unscrews quickly and easily at the will of the operator.

The joint has a series of driving shoulders around the full circumference of the tool to provide ample driving area for heavy torque loads. In addition, the locking shoulders are so designed that when the joint is made up, they will mate in only the correct position. This eliminates the possibility of overtightening or "freezing" the joint and insures quick, positive release whenever desired. Packers prevent fluid leakage while drilling and are so designed that six unscrewing turns can be effected without losing the fluid seal.

The Type "E" permits reverse rotation, when necessary, under normal conditions, as the reverse torque is transmitted through the heavy, spring-loaded collar and tapered shoulders. Yet, when release is desired, it requires not more than half the torque needed to

break a normally made-up tool joint of the same size!

The Type "E" safety joint is stronger than the drill pipe in which it is run and will safely transmit all driving torques. It is available in all popular sizes of pipe including both regular and full hole. The company's address is 5512 South Boyle Avenue, Los Angeles, Calif.

Ultraviolet Light Source for Estimating Fluorescence

The development of a new inexpensive ultraviolet light source for the visual estimation of fluorescence in crude-oil samples to determine the petroleum fractions content has been announced by Pfaltz & Bauer, Inc., Empire State Building, New York City. Simple in operation, highly efficient and compact, it lends itself to wide application in the petroleum laboratory.

For the research chemist interested in quantitative analysis, the Pfaltz & Bauer Fluorophotometer is offered. With this instrument it is possible to record minute traces of fluorescence in a liquid or solution from a reading instrument.

The fluorescence is picked up by a photoelectric cell and converted into electrical energy causing a deflection on the scale of the galvanometer. This instrument may also be used as a colorimeter, nephelometer and turbidity meter.

TRADE LITERATURE

NATIONAL TRANSIT PUMP & MACHINE CO., Oil City, Pa.—An illustrated catalog on Transit Marine rotary pumps. The catalog has 16 pages, and is replete with descriptions of the line.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO., East Pittsburgh, Pa.—A brief treatise discussing proper maintenance for explosion-resisting apparatus.

OIL WELL SUPPLY CO., Dallas, Tex.—Three new bulletins: H1-442, on the No. 2000-CT combination head; H2-442, on the No. 2000 stuffing-box casing head; and J2-442, on the No. 12-A pumping jack. These bulletins provide complete descriptions, with half-tone illustrations and drawings of the three items.

Iverson Tool Co. Appointed Bucyrus-Erie Distributor

Iverson Tool Co., Tulsa, has been appointed distributor for Bucyrus-Erie spudders in Oklahoma, according to a recent announcement from Bucyrus-Erie Co. The new Iverson territory includes all of Oklahoma excepting the three Panhandle counties, which will continue to be served by Murray Tool & Supply Co. of Pampa, Tex.

Iverson headquarters are at 215 West Second Street, Tulsa. There is also an Iverson store in Oklahoma City and a store and shop in Okmulgee.

In addition to the Oklahoma territory, Iverson is also distributor for Bucyrus-Erie spudders in Chaves, Eddy, Roosevelt and Lea counties, New Mexico, and part of western Texas. These territories are served by Iverson offices in Artesia and Fort Worth. As heretofore, Bucyrus-Erie spudder distributors in the Southwest work with the cooperation of the Bucyrus-Erie branch office, 1806 Tower Petroleum Building, Dallas, Tex.

Joseph T. Ryerson Began 100 Years Ago as Small Iron Store

It was in 1842 that the founder of Joseph T. Ryerson & Son., Inc., Joseph T. Ryerson, went west from Pittsburgh to Chicago and started his small "Pittsburgh Iron Store" on the banks of the Chicago River. In the years that followed, the Ryerson organization grew from a small iron store in muddy prerailroad Chicago to a nation-wide service with 10 key-city plants.

E. L. RYERSON

E. D. GRAFF

The 10 Ryerson plants will normally carry in stock thousands of tons of steel in more than 11,000 different kinds, shapes and sizes. Ryerson stocks, however, are much smaller today because industry in making its quick changeover from peace to war production has had to have great quantities overnight.

Ryerson's chairman of the board today is Edward L. Ryerson, grandson of the founder, who is also chairman of Inland Steel Co., now its parent company. His brother, Joseph T. Ryerson, who served as president of the Ryerson company during the first World War, continues as a director of Inland Steel. Everett D. Graff, veteran steel executive and 35 years with the Ryerson company, is now its president. Headquarters remain in Chicago, but the organization's expansion includes plants in Jersey City, Boston, Philadelphia, Buffalo, Cincinnati, Detroit, Milwaukee, and St. Louis, with sales offices in many other cities.

Within 6 months of the opening of the first store, new and larger quarters were rented. And just 2 years from the founding, Joseph T. Ryerson leased property and erected a two-story brick warehouse in what is now Chicago's Loop.

The increasing tempo of the steel industry brought about the incorporation of the business in 1888 as Joseph T. Ryerson & Son, Inc., under Joseph T. Ryerson's son, Edward L. Ryerson. And a few years later the company moved to a tract covering about 21 acres at Sixteenth and Rockwell streets, its present Chicago location.

In 1914 Ryerson purchased the W. G. Hagar Iron Co., of St. Louis. Additional warehouse space with enlarged switching and shipping facilities were soon built and this first branch plant became the forerunner of a city-by-city expansion which was to continue for 11 years.

Constant metallurgical research, both in Ryerson laboratories and in conjunction with steel mills and manufacturers, has brought about the development of the "Ryerson Certified Steel Plan." The company also has a special plan for alloy steels that includes the selection of entire heats of steels that meet the Ryerson specifications. A chart is furnished with each shipment of alloys to give accurate chemical and physical properties, heat treatment response, etc., as a guide to proper heat treatment.

The Ryerson company renders an important peacetime service to industry by making available from stock thousands of sizes and kinds of steel products. Small and large shops alike can get steel from stock in 24 hours or less. This service is particularly important on small orders.

In wartime, this essential steel-in-stock service is even more important, because it expedites manufacturers "changing over" to war production and assures overnight service on steel needed for replacement or maintenance.

AMONG EQUIPMENT MEN...

Oil Center Tool Co. Elects

A. J. PENICK

H. D. START

B. V. FISHER

The board of directors of Oil Center Tool Co., Houston, Tex., has announced, effective April 2, 1942, the reelection of A. J. Penick, president, and H. D. Start, vice president and plant manager. B. V. Fisher, formerly vice president and sales manager, has been elected secretary-treasurer. Mr. Fisher will continue to supervise the sales of the company.

C. N. Barney Elected Vice President of Worthington

The board of directors of Worthington Pump & Machinery Corp., Harrison, N. J., has elected Charles Neal Barney, Scarsdale, N. Y., a vice president of the corporation. A member of the Worthington organization from 1918, he has been treasurer since 1931, as well as head of the corporation's legal department.

Mr. Barney formerly practiced law in Massachusetts and was a lecturer at Northeastern Law School and Boston University Law School. He is a member of the American, Massachusetts and New York bar associations, author of the law text "Equity and Its Remedies," and was, early in his career, mayor of Lynn, Mass. He is a member of the Society of Mayflower Descendants (New York); the University Club (New York), and Fox Meadow Tennis Club, Scarsdale, N. Y.

Currier Elected President of Tubular Exchanger Manufacturers Group

Charles H. Currier has been elected president of the Tubular Exchanger Manufacturers Association. Mr. Currier is vice president and general manager of Ross Heater & Manufacturing Co., a division of American Radiator & Standard Sanitary Corp., with general offices and plant in Buffalo, N. Y.

Other officers elected with Mr. Currier are W. C. Beekley, vice president, and W. J. Parker, secretary-treasurer, reelected. The executive committee consists of Mr. Currier, Mr. Beekley, C. S. Patton, and M. W. Sterling, ex officio.

In addition to Ross Heater & Manufacturing Co., Inc., these firms comprise the membership of the association: Foster Wheeler, Alco Products, Henry Vogt Machine Co., Whitlock Manufacturing Co., Griscom-Russell, Struthers-Wells, the Lummus Co., and M. W. Kellogg Co. All are manufacturers of heat exchangers.

Headquarters of the association are at 366 Madison Avenue, New York City.

Rose Assistant General Manager Of Jas. P. Marsh Corporation

A new post has been created in Jas. P. Marsh Corp. of Chicago to take care of enlarged activities.

A. D. Rose, for many years sales manager, has become assistant general manager, and the position he has vacated will be filled by James Emmett, Jr., formerly assistant sales manager. "Al" Rose and "Jim" Emmett are well known in the oil industry.

E. W. Farrow California Representative for Mission

E. W. "Al" Farrow is now the representative for Mission Manufacturing Co. in the State of California. Mr. Farrow was formerly sales manager for Security Engineering Co., and he is replacing Ralph Clemons, who is now with the Petroleum Equipment Co.

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418 Bowen Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney. Box 1122, Little Rock, Ark.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years Experience
Inquiries Invited
B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

FOR SALE: Oil and gas leases, small production, drilling propositions, fluorspar and rock asphalt deposits. Reports and maps furnished on request. W. P. Harley, Bowling Green, Ky.

EAST TEXAS 9,000 ft. Paluxy-Trinity sand wildcat. Quick bet for 10 to 50 for one. E. CROFT, PROCTOR, TEXAS.

CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

OIL INVESTMENT OPPORTUNITY
$50.00 will buy oil lease on townsite lot or royalty spread large tract all near deep test well to drill in Hunt County, Texas, immediate future. If interested write Guy J. Stumpff Co., Box 23, Commerce, Texas.

OPERATORS: WE HAVE 4000 acres full geology and geophysical shows structure high developing R. M. area. Will farm or partly finance drill 3000 ft. Box A-984, The Oil and Gas Journal, Tulsa, Oklahoma.

MICHIGAN—1,160 ac. to lease for Oil and Gas. Map free. Owner: L. J. Meldrum, 8354 Epworth, Detroit, Mich.

FOR LEASE the NE¼ of the NE¼ of Sec. 3-34-3W, Toole County, Montana.
T. S. MILES
1004 First Natl. Bank Bldg., Omaha, Neb.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

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Manufacturers' Agent

MANUFACTURERS' Representatives known to the best oil trade desired for quality specialties now being sold to the best oil field trade, repeat items, excellent commissions, exclusive territories open. Box A-983, The Oil and Gas Journal, Tulsa, Okla.

MANUFACTURERS Agent, 18 years representing first class line of specialties for drilling rigs, with Top Flight Contacts, Texas, Louisiana, and Arkansas, warehouse in Houston, interested in representing one or two reliable manufacturers of Drilling, Production, Refining, or Defense Equipment. Box A-993, The Oil and Gas Journal, Tulsa, Okla.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

OUT OF 5000 American financial houses only 223 bought small issues last few years. The 223 names $4.00. JOHN F. MORRIS, Box 5411, Philadelphia.

Situations Wanted

LAND MAN desires connection with responsible operator, independent or major company. Twenty years' experience actual field work and as supervisor leasing activities for various companies and independent operators in Oklahoma, Texas, Louisiana and Arkansas. Thoroughly familiar with land titles, curative instruments, etc. Administrative ability and experience. Now on special assignment for major oil company. Age 44. Box A-973, The Oil and Gas Journal, Tulsa, Okla.

OIL ACCOUNTANT: 24 years' experience, 19 years with present company as Chief Accountant and Secretary. Company engaged in all phases of oil industry. Can furnish excellent references, age 41, married, desire position with reputable company that will offer broader opportunities. Box A-982, The Oil and Gas Journal, Tulsa, Okla.

VICTIM OF 40-ACRE SPACING
Executive, capable of operating Refining, Pipeline Production Departments. Have had actual operating experience, including complete charge. Willing to start moderately if opportunities for advancement are available. Good references. Draft status 3-A. Box A-991, The Oil and Gas Journal, Tulsa, Okla.

EXP. refinery operator can handle topping, crack, and treat, units. Box A-994, The Oil and Gas Journal, Tulsa, Okla.

REFINERY Instrument and Electrician foreman, 11 years' experience, still operation, construction and maintenance. Factory trained on instruments. Age 30, resourceful, careful, energetic. Good references. Mid-west preferred. Box A-970, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

LARGE NEW YORK engineering firm requires chemical engineers age preferably 25-30 with any following experience:
1. Petroleum refinery experience in operation or design of stabilizers, absorbers and light end equipment.
2. Refinery experience in design or operation of plants for solvent dewaxing and solvent extraction of lube oils.
3. Refinery experience in design or operation thermal or catalytic cracking plants. In reply state education qualifications and refinery experience in detail. Also salary expected and status regarding military service.

Box A-972, The Oil and Gas Journal.
Tulsa, Okla.

An oil well service company needs engineers for field work, over 45 years of age or draft exempt. Must be willing to do shift work and free to move. Salary $200 to $300 per month depending on experience. In replying give details of experience, draft status and recent photograph. Applications held confidential. Box A-990, The Oil and Gas Journal, Tulsa, Okla.

DESIGNERS AND DRAFTSMEN
For vital war plant work carrying high priority ratings of A-1-A to A-1-C. Working 50 hours per week with remuneration on basis of a 40-hour week with time and one-half for work in excess of 40 hours per week. Program covers 1½ years. Must have experience in design of:
Oil Refinery Process Piping
Concrete and Structural Steel
Heat Exchangers, Pressure Vessels
Electrical Control, Light and Power
Conduit Systems.
Instrument Engineers able to select and specify proper control instruments for oil refinery units.
Application should be made by letter giving age, nationality, concise outline of previous experience and educational background, present salary, salary desired and references. Include recent photograph.
BLAW-KNOX COMPANY
Process Industries Dept.
P. O. Box 5087
East Liberty Station, Pittsburgh, Pa.

Help Wanted

DESIGNERS AND DRAFTSMEN

For Oil Refinery work carrying high priority ratings of A-1-A and A-1-B under

Government Defense Program

Working 56 hours 3 weeks per month and 44 hours one week with time and one-half for work in excess of 40 hours per week.

Must have experience in design of:

Oil Refinery Process Piping,
Concrete and Structural,
Oil Heating Furnaces,
Pressure Vessels,
Electrical Control
and
Light and Power
Conduit Systems.

Can use several piping squad leaders. Must be thoroughly experienced on piping design and layout.

ARTHUR G. McKEE & COMPANY
Engineers & Contractors
OIL REFINERIES
BLAST FURNACES
STEEL PLANTS
2300 CHESTER AVENUE
CLEVELAND, OHIO

REFINERY Maintenance Engineer, experienced in general refinery maintenance, design and construction. Must understand repair and cleaning of cracking units, internal combustion engines, and all types of pumping equipment. Box A-953, The Oil and Gas Journal, Tulsa, Okla.

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co. 115 S. Cinn., Tulsa, Oklahoma.

Equipment Wanted

WANTED
Large Steel Storage Tanks and Structural Steel Buildings.
GREENSPON'S
National Stock Yards
(St. Clair County), Ill.

WANTED TO BUY: TRANSPORT TRUCKS WITH MINIMUM CAPACITY OF 3,000 GALLONS. Box A-981, The Oil and Gas Journal, Tulsa, Okla.

WANTED: 2 Ingersoll-Rand XOB Compressors. State size of cylinders and condition of compressors. Box A-980, The Oil and Gas Journal, Tulsa, Oklahoma.

WANT small portable rotary capable of 500' 6" hole, under $1000.00, also small swivel, hose, 4 x 5 or 4 x 6 pump, reply Box 254, Powell, Wyoming.

2—35,000-55,000 bbl. storage tanks.
2—1300' air compressors.
20—25 ton locomotive cranes.
R. C. STANHOPE, INC.
60 E. 42nd St., New York, N. Y.

For Sale—Equipment

FOR SALE
Seven new No. 480F, V-Belts.
LUCEY PRODUCTS CORP., Tulsa, Okla.

FOR SALE—1875 new 4½" OD Seamless Pen V thread Casing Coupling. Patridge, Cities Service Oil Co., Bartlesville, Okla.

For Sale—Equipment

FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

FOR SALE: 125 H.P. 200 W.P. Broderick Boiler, Code Condition, $975. Melton Supply Co., Seminole, Okla.

FOR SALE: 9 miles of first class 3" line pipe with recessed couplings, perfect threads, and standard weight line pipe. 20 miles 2" line pipe, first class condition. The Interstate Pipe & Supply Company, P. O. Box 611, Marietta, Ohio.

USED
OIL FIELD EQUIPMENT
FOR SALE

100—6⅝" O.D. 8V thread—Walworth, Wescott and Crane swing check valves.
1000—4" and 6" standard 8V thread—Line pipe collars, Single dutchman.
Carload miscellaneous shafting, I beam and channel iron.
Pipe—Reinforcing Rods—Small tanks. 4000' of 17#, 20#, 24# 7" O.D. Casing, 2000' of 13# and 17#, 5½" O.D. Casing.

GALOOB IRON & METAL CO.
Box 372 Healdton, Okla.

FOR SALE: 1 Motor driven rotary drilling rig; suitable for 6,000 ft. work. Melton Supply Co., Seminole, Oklahoma.

FOR SALE: 1 Askenia Type Magnetometer #7970, $750.00. Cities Service Oil Co., Bartlesville, Okla.—H. D. Patridge.

NEW POWER UNITS
Four Caterpillar gasoline motors, new, 75 H.P. complete with governors, master clutch, carburetor, and magneto, not mounted, suitable for power unit; $395.00 each. O. C. Evans, Mt. Sterling, Ky.

FOR SALE: At Oklahoma City, 2 85-HP, 175 lb. Oil Field Type Boilers, just shopped. $850.00 each. H. D. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P. International Motor. Melton Supply Co., Seminole, Oklahoma.

FOR SALE
COMPRESSORS

Complete Repressuring or Air Lift Plant for Immediate Delivery.
2—13 & 5½ x 12 Ingersoll-Rand XOB compressors 400# pressure V-belt driven by 120 H.P. Chicago Pneumatic 3-cylinder vertical gas engines.
2—12 & 7 x 10 Chicago Pneumatic 400# pressure vertical compressors direct connected to 120 H.P. 3-cylinder Chicago Pneumatic vertical gas engines complete.
Used very little — excellent condition. Located on original foundation in Louisiana.

EARL E. KNOX COMPANY
Erie, Penna.

FOR SALE: Improved Type Hydraulic Pipe Pulling Machine. George W. Davis R.F.D. #2, Muskegon, Michigan.

FOR RENT: Drilling rig (steam), derrick, etc. Fully equipped. Excellent condition. Capable to 9000' economically. Cheap to rent. Prefer long period. Sorrento Petroleum Corp., American Bank Bldg., New Orleans, La.

FOR SALE—15,000 ft. used 4½" OD 15# Seamless P.E. Pipe. Patridge, Cities Service Oil Co., Bartlesville, Okla.

5—80 HP Type 10 Bessemer Compressors complete and some spare parts for Clark and Bessemer units. Reshopped Bessemer, Clark, Cooper, I-R, Miller compressor cylinders. 1—8' x 40' Tpisa Type Tower, 2—8 x 34' SW Scrubbers 40# WP, 1—5 x 16' SW Evaporator 40# WP, 1—49" x 12' SW Reflex Tower, 1—9' x 4½' Graver Water Filter, 2—6' x 7' Graver Water Softeners.

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404 E. 2nd St. Tulsa, Okla.

REFINERY EQUIPMENT—TOWERS—HOT OIL PUMPS
BUBBLE TOWERS—STABILIZERS—ABSORBERS—GRAY TOWERS

3′ to 8′ Diameter x 24′ to 74′ Height x ¼″ to ¾″ Shell Thickness, Riveted and Welded Reaction Chambers, 4″ and 5 3/16″ Thick, 4′ x 44′ and 5′ x 45′

3—24″ x 5″ x 24″ Worthington Hot Oil Pumps, Completely Reconditioned

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W. C. Berry or H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

ALL OR ANY PART—COMPLETE 2000 BBL. REFINERY

Bubble Tower 5′x52′x⅜″ — 21 Trays With Caps Chrome Alloy — 2000 bbl. Pipe Still, 2½″ ID x 2 15/16″ OD x 20′ Tubes Alloy Headers — 8 Heat Exchangers, 255 sq. ft. ea. All New Tubes — Complete Copper Sweetening Unit — New Carload Ethyl Plant — 47 Storage Tanks from 500 to 15000 bbl. cap. — 30 Pumps All Types — Valves — Fittings — Pipe — 5 Transport Trucks Good Tires.

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GREAT BEND, KANSAS

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4—Diamond T tractors, 10 wheels, good tires. Capacity 77 bbls. each.

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TULSA, OKLAHOMA

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25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
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26 West 2nd St., Cincinnati, Ohio

FOR SALE: 1—25 HP Westinghouse Sleeve Bearing Weatherproof type "CS" Electric Oil Well Pumping Motor. Serial #1134267; Class 3553; 3-phase; 60 cycle; 220/440 volt, 1150 R.P.M. Practically new. Box 390, Blackwell, Oklahoma.

2800 FEET, 3½″ OD 13.30# Seamless Interior Upset Drill Pipe. All 21′ 9″ joints. Never drilled. Some tool joints. Current price, less 20%. Sorrento Petroleum Corp., American Bank Bldg., New Orleans, La.

TANKS: Three 100,000 and one 325,000 gallons; PIPING, VALVES, METERS, ETC. ON WATER FRONT IN PHILADELPHIA. Box A-992, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: 12 K.W. Portable Light Plant powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

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Used Engines, Compressors, Power Plants and Gasoline Plant Equipment.

We Rebuild and Guarantee

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EMCO-McGAUGHY Integrator for Foxboro and Emco Recording Orifice Meter Charts, good condition. Utility & Industrial Supply Co., Jackson, Michigan.

50,000 FEET of 2″ 4.70# 10 V thread upset used seamless tubing.
FT. WORTH PIPE & SUPPLY CO.
Ft. Worth, Tex.

REFINERY EQUIPMENT
From
RODESSA REFINERY, SHREVEPORT, LA.

ALLOY CRACKING TUBES—3½″ OD x 2⅝″ ID x 31′ 6″ long. 1¼% Chrome DM. K4B HEADERS—Series 7000. 3½″ OD x 6¼″ Centers.

ALSO AVAILABLE FOR IMMEDIATE DELIVERY:

1—CRACKING CHAMBER—6′0″ x 65′ 4¼″ overall, self-supporting. Head and shell thickness 1 1/16″. Quadruple riveted, double strap butt joints. Seams and rivets welded inside and outside.
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At (Cedar Grove) Shreveport, La.
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Harry B. Strauss, Manager

FOR SALE

20,000′ 12¾″ O.D. lapweld pipe.
5,000′ 7″, 24 lb. seamless casing.
5,000′ 2½″ seamless upset tubing.
300 sets 3″ tool joints, full hole.
200 sets 3″ full hole tool joints.

Both steam and power drilling rig. A complete line of drilling and pumping equipment.

Wire, write, or phone the

Louisiana Iron & Supply Company
Shreveport, Louisiana

FOR SALE: At Bartlesville, two 40-gallon Soda and Acid "Ajax" Fire Extinguishers mounted on wood wheels. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: Near Sasakwa, Okla., 1 Cooper Gas Engine, Type G-40, 400-HP, with or without Compressor Cylinders. Patridge, Cities Service Oil Co., Bartlesville, Okla.

I have sold second-hand alloyed once run Okla City Sucker rods to the largest independent oil producers in Kansas, Okla. & Texas, five producers have bought from 50 to 300,000 ft. all with good results. I am subject to call at anytime. I will dispose of the balance of ¾″, ⅞″ & 1″ in truck load lots delivered to your location on 60 days trial, for about half of new price. Your use subject to the approval of my engineer. Can also be used for pull rods. Six 2½″ x 7″ Guiberson tubing catchers and six 2½″ x 7″ sucker rod overshots.

MIKE TRAVIS
1702 S. Boulder Tulsa, Okla.
Phone 2-2447

FOR SALE: 1 Wilson-Atlas Rig and Derrick, complete, with 2 225-HP Buda Engines. 4000 ft. 4½″ Drill Pipe. Condition A-1. Baldwin-Reed Drilling Co., 314 Waggoner Bldg., Wichita Falls, Texas.

BESSEMER Gas Engine & Compressor Type 8 50 HP and 80 HP d. c. units complete or in part. HTKS Magnetos, force feed lubricators, etc. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE

OIL STORAGE TANKS

IN GOOD CONDITION

1—5,000 Bbl.
2—2,500 Bbl.
1—1,000 Bbl.
1— 600 Bbl.
1— 100 Bbl.
2—1,200 Bbl. Agitators (prac. new)

Can be inspected at Middlesex Refinery Company, Raritan, N. J.

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2280 Woolworth Bldg.
NEW YORK CITY, N. Y.
TELE. CORT. 7-4676

FOR SALE AT McCOOK, NEBRASKA:
1—60 H.P., H. R. T. Bros Brothers Boiler.
KANSAS-NEBRASKA NATURAL GAS COMPANY, INC.
Hastings, Nebraska.

ONE portable rig, dual motor, complete, good for 2000 ft. 1300 ft. 2½″ drill pipe. Hughes Acme Tool Joints. Sutter Well Works, Pass Christian, Miss.

FOR SALE: Pressure Vessels handling 100 pounds working pressure 8′ diameters 31′ 8″ lengths. Rectangular tanks, capacity 25,000 gallons and 40,000 gallons each. 26 tons I beams one carload. 12-inch I beams 13′ 2″ long. 36-in. I beams in 22, 36, 38 foot lengths. I beams $61.00 ton, f.o.b. here, approx. 27 tons. Shipments made same day purchased. HARVEY BROS., 706 Rudd, Canon City, Colo.

100,000 ft. 12¾″ O.D. x ⅜″ Used Lapweld Steel Line Pipe single random, Harrisburg, Pa. 10,000 ft. 30″ O.D. x ⅝″ New Buttweld Steel Pipe 30 ft. lengths, Philadelphia, Pa.
ALBERT PIPE SUPPLY CO., INC.
Berry and N. 13th Streets
Brooklyn, N. Y.

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122 FT. Tubular Steel Derrick. Rent by month, or for sale. Double Eagle Refg. Co., D. L. Kelly, Okla. City. Tel. 2-9070.

Reconditioned, Tested and Guaranteed Gate Valves for sale. Large stock, sizes 12″ to 2″, flanged end and screw end, various pressures.
Stock List and Prices on Request.

THE GATE VALVE SHOP
120 Tuke Box 1936
Pampa, Texas

#81 KEYSTONE Spudder, 65 ft. mast, all steel, Caterpillar mount complete with 4″ to 10″ tools, 5 x 10 Gardner-Denver Mud Pump, 80 HP International Gas-Gasoline Motor, mounted on skids. Utility & Industrial Supply Company, Jackson, Michigan.

HAVE remaining only 2500 feet 20″ O.D., ⅞″ Wall .35-.45 Carbon Steel Pipe P.E. in 50 ft. length good for low pressure line. Also Quantity Dresser Couplings, Ells and Valves. Subject to prior sale.

Write—Wire—Or Phone

BROWN-STRAUSS CORPORATION
Kansas City, Missouri

EIGHTY extra heavy 3½″ Key Headers, Jenkins Bubble Tower, Flash Tower, two Boilers and Settings, 2 Treating Towers, quantity of Valves and Fittings. Western Tank & Road Supply Co., Wichita, Kansas, or F. E. Reinhardt, General Delivery, Evansville, Ind.

FOR SALE

Dismantling the Old Carlyle, Illinois Pool.
Thousands of feet of: casing 5⅛, 6¼, 6⅝, 8¼, 10, 12½, and 16″; tubing 2″ standard and upset; 2″ line pipe; ⅝ sucker rods and ¾ surface rods.
3—25 H.P. Ball Gas Engines
1—25 H.P. Bessemer Gas Engine
9—Power Wheels—Several types
1—40 H.P. Pattin Bros. Gas Engine, 2 Stage Air Compressor, Direct Drive
4—25 H.P. B&Q and G&F Boilers
9—Belt tighteners and belts.

Albert A. Woll
Carlyle, Illinois

FOR SALE: 2—steam rotary drilling rigs capable of drilling 4100 feet. Menke Estate, 603 Waggoner Bldg., Wichita Falls, Texas. Phone 3883.

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OIL FIELD — INDUSTRIAL

Special

1 Marley Forced Draft Cooling Tower, 400 HP capacity.

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Complete Line of rebuilt oil field equipment.

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Journalisms:

CENSORSHIP being what it is these days and the Journal staff being particularly careful not to disclose information of value to the enemy, we failed to mention a recent move of one of our contributing authors until the matter had been cleared with the proper authorities.

J. William Ferguson, who wrote the piece, "Calculation of Back-Pressure Tests," on Page 52 of the May 7, 1942, issue, recently resigned as assistant gas engineer, Canadian River Gas Co., to become associate natural-gas engineer, U. S. Bureau of Mines staff, Helium Plant, Amarillo, Tex. The announcement of the change is carried in a letter from R. A. Cattell, chief, Petroleum and Natural Gas Division of the bureau.

Before assuming his new position, Mr. Ferguson collaborated with Milton F. Shaffer, Hagy, Harrington & Marsh, Amarillo, on a new article, "Practical Application of Back-Pressure Tests to Gathering-System Problems." This piece will appear in an early issue of The Oil and Gas Journal and will be of great value to operators of repressuring, cycling, gas-injection and gas-lift operators as well as natural-gas-company engineers.

■

THIS week an SOS call came from our Washington office for a supply of the Journal's maps, chiefly natural-gas and crude oil and product pipe-line maps. It seems that just about every bureau in Washington has need for these maps, and when they need them they need them quickly. So quickly in fact that their seekers are too impatient to get the maps through the ordinary channels of obtaining a purchase order and sending it to the Tulsa office. They want the maps on the spot, and to get them are willing to dig into their own pockets. "They are the best thing of their kind we have been able to find anywhere and there are no substitutes" was one representative comment. The maps have been sent, and will be available for spot delivery when harassed Government men call at our Washington office.

■

AT the conclusion of the present war the most appropriate headline which could be written would probably be "American ingenuity conquers all." A current example of what can be done when grim necessity glares will be described in an article in the Engineering and Operating section of The Oil and Gas Journal next week.

The curtailment of steel for normal civilian needs threw a great burden on the oil operators who have been using great tonnages for the equipment of oil wells, particularly for casing. The Illinois Geological Survey immediately sought a remedy for the situation as it was vitally interested in seeing that the numerous wells in the state were maintained in good working condition and that shallow wells drilled in the future could be properly cased.

Out of the work of that organization, carried on in conjunction with others, has come a fiber pipe which can be used for oil-well casing. The first string has already been successfully landed in a shallow Illinois well and inquiries at the Journal office indicate that oil companies and supply companies are interested in more details.

Fred Squires, petroleum engineer for the Illinois Geological Survey, is the author.

CALENDAR

May

NATURAL GASOLINE ASSOCIATION OF AMERICA, Mayo Hotel, Tulsa, May 14-15.

KENTUCKY OIL AND GAS ASSOCIATION, annual midyear meeting, Lexington, Ky., May 22.

WEST TEXAS GEOLOGICAL SOCIETY, spring field trip, vicinity of El Paso, Tex., May 23-24.

NATIONAL ASSOCIATION OF PURCHASING AGENTS (oil-company buyers' group), Waldorf-Astoria Hotel, New York City, May 25-28.

June

CANADIAN GAS ASSOCIATION, thirty-fifth annual meeting, Windsor Hotel, Montreal, Que., June 4-5.

ILLINOIS-INDIANA PETROLEUM ASSOCIATION, annual conference, combined with ILLINOIS BASIN CHAPTER, AMERICAN PETROLEUM INSTITUTE, annual meeting, Robinson, Ill., June 6.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, semiannual meeting, Cleveland, Ohio, June 8-11.

AMERICAN SOCIETY OF TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26.

October

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, twenty-third annual meeting, Dallas, Tex., October 8-10.

NATIONAL STRIPPER WELL ASSOCIATION, annual convention, Wichita, Kans., October 19.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, thirteenth annual convention, Wichita, Kans., October 20-22.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

ILLINOIS MINERAL INDUSTRIES CONFERENCE, Campus, University of Illinois, Urbana, Ill., October 30-31.